DEC 27 1923

Vol. II No. 6
October
1923

The Journal of Personnel Research

Official Publication of
Personnel Research Federation

Measurement in Vocational Selection
—*Max Freyd*

News Notes Book Reviews Abstracts

Published Monthly
Williams & Wilkins Company
Baltimore, U. S. A.

Made in United States of America

Editorial Board

ALFRED D. FLINN
Director, Engineering Foundation

ALICE HAMILTON
Assistant Professor of Industrial Medicine, Harvard Medical School

RICHARD W. HUSBAND
Director of Personnel Research, Dartmouth College

WESLEY C. MITCHELL
Director of Research, National Committee on Economic Research

LEONARD OUTHWAITE
Personnel Research Federation

LEWIS M. TERMAN
Professor of Education, Stanford University

MARY VAN KLEECK
Director of Industrial Studies, Russell Sage Foundation

JOSEPH H. WILLITS
Wharton School, University of Pennsylvania

FRANKWOOD E. WILLIAMS
Medical Director, National Committee for Mental Hygiene

MATTHEW WOLL
Vice President, American Federation of Labor

Editor
WALTER V. BINGHAM
Director Division of Cooperative Research, Carnegie Institute of Technology

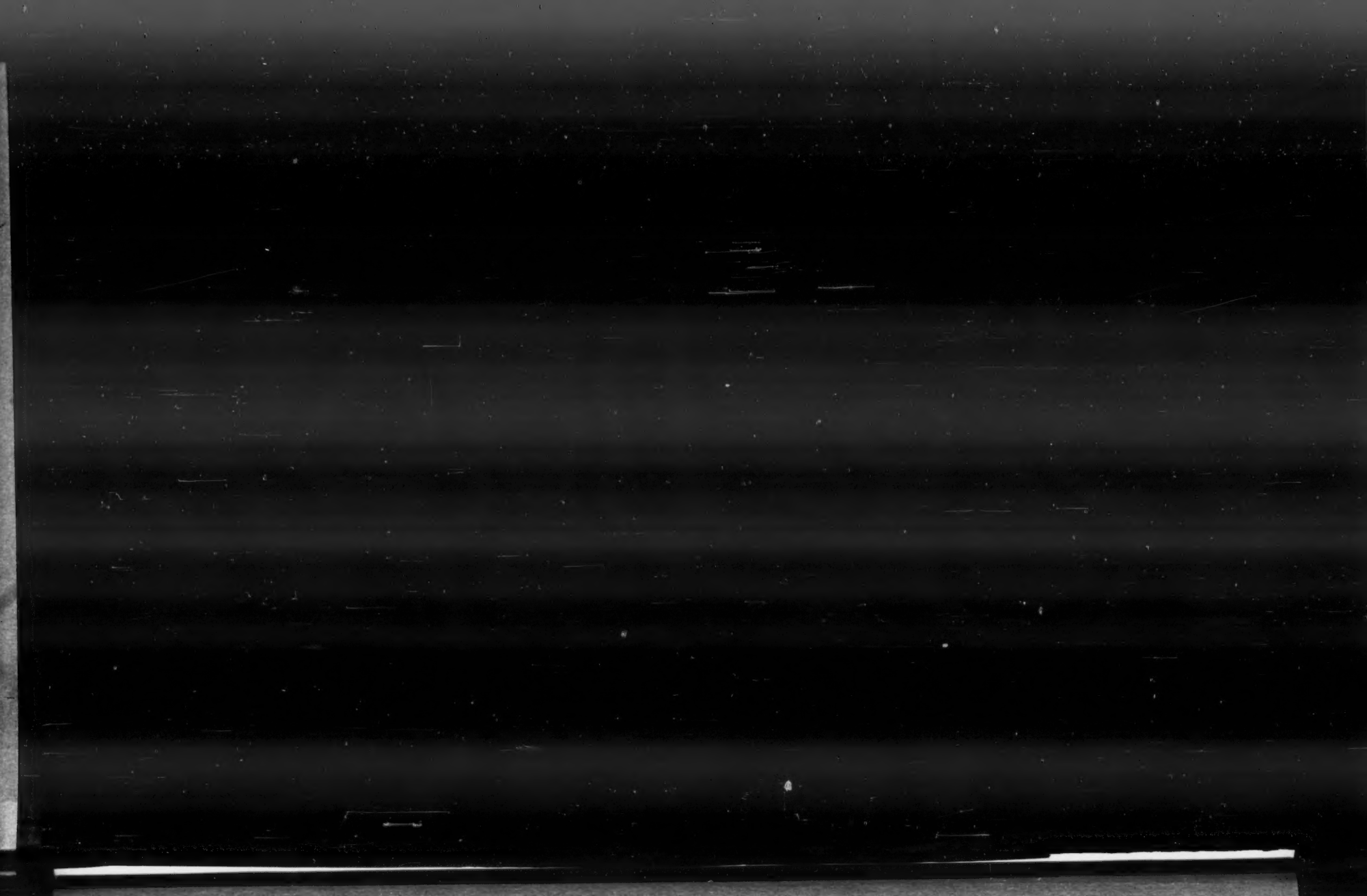
Associate Editor
LOUIS L. THURSTONE
Bureau of Public Personnel Administration, Washington

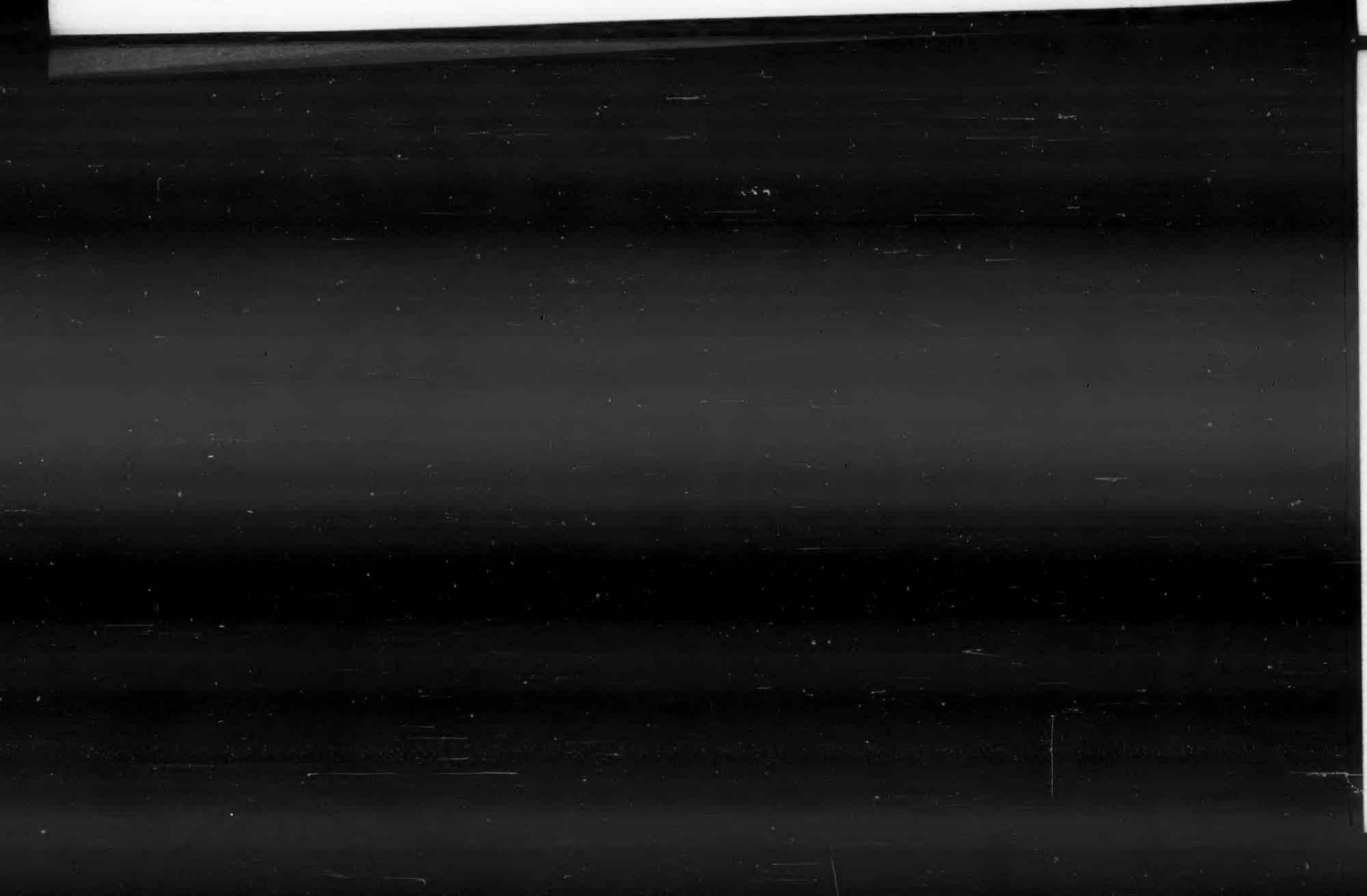
Managing Editor
CLARENCE S. YOAKUM
Director Bureau of Personnel Research, Carnegie Institute of Technology

Price per volume, net, postpaid, $5.00, United States, Canada, Mexico, Cuba; $5.50, other countries.

Entered as second-class matter May 20, 1922, at the post office at Baltimore, Maryland, under the act of March 3, 1879.

Copyright, 1923, by Williams & Wilkins Company





Measurement in Vocational Selection

An Outline of Research Procedure

By Max Freyd, *J. Walter Thompson Company, New York*

This paper outlines a procedure for research in developing, evaluating and installing measurement methods in vocational selection. It tells how to construct a vocational test and how to determine the degree of its reliability. The technique described has been carefully evolved and increasingly used by research workers but has not previously been formulated in toto. This formulation is based on the author's own experience, as well as on the accumulated knowledge of specialists who have contributed to the literature of research in vocational selection.

This outline presupposes some familiarity with personnel administration, psychology, mental test technique and statistical methods. Although it adds little that is new to experienced investigators in this field, they will find it valuable as a check list, and as a guide to place in the hands of their less experienced assistants. It will be useful to industrial research workers and to executives who want to know at first hand what is really involved in a thorough-going program for developing improved means of selection for a given occupation. It will also find a place in connection with college courses in vocational psychology.

The first two chapters discuss the necessary preliminary steps of vocational analysis, together with the selection or construction of the tests and other instruments of measurement. The third chapter treats of the technique of trying out the tests to determine their validity, while the final chapter deals with the installation and use of the new aids in selection.

OUTLINE

Introduction.

I. Preliminary Steps

A. The criterion of vocational accomplishment
   1. Time required to train the employee
   2. Standings in firm schools
   3. Measures of production
   4. Loss due to breakage or claims

5. Salary
6. Commissions and bonuses
7. Length of service
8. Advancement in the firm
9. Degree of responsibility
10. Membership in professional societies
11. Ratings
12. Combinations of two or more criteria

B. Selecting the subjects for the experiment
1. Employees or applicants
2. Employees plus applicants
3. Sampling
4. Sex
5. Age
6. Willingness to take the tests
7. Previous knowledge of the tests
8. Sensory defects
9. Motor defects
10. Literacy

C. Determining the abilities necessary to success
1. Sources of information in making a list of psychological specifications
2. Evaluation of the list

II. The Measuring Instruments

D. Selecting the measuring instruments
1. General principles relating to the selection of measuring instruments
   a. Objectivity
   b. Standardization
   c. Analogy with psychological abilities
   d. Resemblance to vocational tasks
   e. Broadness of sampling of measurements
   f. Innate versus acquired abilities
   g. General versus special abilities
2. Sources of test material
   a. The vocational apparatus
   b. Former studies of the same vocation
   c. General test publications
   d. Miscellaneous sources
3. Principles of test construction
   a. Group versus individual tests
   b. Types of test items
   c. Representative value of the items
   d. Order of items
   e. Length of test
   f. Time limits
   g. Directions for giving the test
   h. Directions for scoring the test
   i. Omnibus tests
   j. Alternative forms
   k. Arrangement in series
4. Determining the functions measured by the tests

III. OBTAINING AND EVALUATING MEASUREMENTS

E. Giving the tests
  1. The test conditions
  2. The procedure
F. Evaluating the tests
  1. The index of relationship
    a. Correlation
    b. Group comparisons
  2. Statistical applications
    a. Based on correlation
    b. Based on group comparisons
G. Combining test scores
  1. Based on the establishment of correlation
  2. Based on group comparisons or critical scores
  3. The profile method

IV. THE MEASURING INSTRUMENTS IN USE

H. Demonstrating the value of the measuring instruments
  1. Their relative predictive accuracy
  2. Their economic value
I. Installation and upkeep
  1. Installation
    a. The examiner
    b. The forms
    c. The room
    d. The procedure
  2. Upkeep
    a. Continued use of the measuring instruments
    b. Modifications of procedure and standards.

Bibliography

Introduction

THE primary emphasis of *vocational guidance* is placed on the individual,—his abilities and where they may be put to the most effective use in commerce and industry. *Vocational selection*, on the other hand, has for its purpose the selection of the most suitable persons for a given occupation. One focuses about the individual, the other about the job. Vocational selection is the more fundamental, since vocational guidance cannot exist without a knowledge of the abilities required for the different occupations and the methods whereby their presence or absence is detected. This outline is concerned directly with vocational selection, particularly with the scientific methods which may here be employed, and only indirectly with vocational guidance. The results of studies carried on with the technique here outlined will be of value not only to the company in which the experiment is conducted and to its applicants, but also to those who give vocational and educa-

tional guidance, since these researches will contribute to the materials for measuring vocational aptitude.

In entering upon an experiment in vocational selection in an industrial organization, the investigator should, if he has freedom of choice, consult the cost accountant to find the department in which increased efficiency in selecting employees would bring about the greatest economic saving to the firm.

He should then obtain or make a complete analysis of the job and its relation to other jobs in the organization. This will involve organization charts, and will reveal what the worker does, what tools he must use, what he must know, what physique and skill he must have, what his conditions of work are, what hours he works, what the source of applicants is, what the chances of promotion are, what the turnover is, and so forth.

The experimenter will next decide upon a criterion of success in the occupation, after consulting executives in the firm. This is necessary in order to have some measure with which the results of the experimental tests may be compared.

The next step is to select persons to serve as subjects for the experiment. The experimenter will be guided in this by the criterion of vocational success which he has chosen, as well as by a number of factors which are brought out in this outline.

The experimenter will now proceed to determine the abilities required to succeed in the occupation. This is facilitated by having for observation the individuals who have been chosen as subjects for the experiment.

When he has made this analysis the experimenter proceeds to select and devise measuring instruments, which to the best of his knowledge measure these abilities. These instruments will be psychological tests, questionnaires, rating scales, etc.

He then applies these measuring instruments under carefully controlled conditions to the subjects whom he has chosen for the experiment.

He evaluates the measuring instruments by comparing his measurements with the criterion of vocational success. Those of his tools are successful whose yielded measurements are so closely related statistically to the criterion of success that knowing the measurement of any person, his degree of success may be closely approximated. The value of this measuring instrument lies in the fact that it tells us how successful any applicant for the job will prove to be.

The experimenter now proceeds to combine the different successful measuring instruments in order to make use of their maximum combined predictive efficiency.

He will then have to justify them by comparing their predictive accuracy with that of the methods of selection already in use.

If they prove to be more efficient and are recommended for use, he must see to their proper installation, and assure himself from time to time that they are being used properly. He must also continuously check up on their predictive accuracy and adjust

them to changes in the type of applicant and industrial demands.

The assumptions in such an experiment are five in number; and, first of all, that human beings have abilities. This word is not used in the sense of a mental characteristic. By ability is meant the proper coordination of muscular responses to achieve a definite end. An ability is measured in terms of the efficiency with which the end is attained. This does not imply any conscious purpose on the part of the worker. This definition includes not only the responses made by those who work with tools, but also the vocal responses of salesmen and orators. It includes inherited as well as acquired coördinations, if such a distinction can be made. In particular it makes no postulates regarding any conscious correlates of muscular responses. Behavior is all that can be studied by the experimenter in this field, and the existence and nature of conscious phenomena must be left to the efforts of others. Abilities may be differentiated according to the muscles that are employed and the type of movements that are made. Abilities overlap in so far as the same muscles or types of movement enter into the responses. There may be an infinity of responses or abilities, corresponding to the number of ends to be accomplished.

The second assumption is that persons differ in any given ability, as measured by the success with which the end is achieved. The success may be stated in terms of some objective measurement or the judgments of competent critics. In some cases it is assumed in addition that the distribution curve for the given ability in the general population or in the specific sampling of the population takes the form of the normal probability curve.

The third assumption, on which this experimental procedure rests, is that these differences in ability are in general relatively the same after training; that is, if the members of a group are measured with regard to the ability before special training, they will in general preserve the same standing relative to each other after the period of training.

The fourth assumption is that different tasks, which may be considered as the ends to be accomplished, demand different abilities. The abilities required for different jobs may overlap in so far as the muscular adjustments are in part identical.

The fifth and last assumption to be made is that the abilities necessary for a job are capable of measurement. The measuring instruments with which this outline will deal in greatest detail are psychological tests. The tests may be expected to measure the ability accurately in accordance with the extent to which they call for the same or similar types of muscular adjustments, reproducing the working conditions in whole or by analysis. If there is a close relationship between tests scores and success at the job, disturbing variables being held constant, the assumption may be made that the relationship is caused by the fact that the two call out the same ability or abilities. Scientifically speaking, a

causal connection between two variables is merely the observed concomitant variation of the two. A causal relationship between test performance and success at the job may be inferred if the correlation between them is high. But even this modicum of theory may be eliminated; if the correlation between test performance and success at the job is high, one may be used as the sign of the other. The test performance, usually requiring a few minutes, then becomes a sample of what the applicant will be able to accomplish at the job over a long period of time.

I. Preliminary Steps

A. THE CRITERION OF VOCATIONAL ACCOMPLISHMENT

Regardless of its logical position in an outline of this sort, the consideration of the criterion of vocational accomplishment at the outset will enable the experimenter to make a more effective formulation of his problem and will avoid later misconceptions. Deciding upon a criterion is a natural preliminary to selecting the subjects for the experiment, and in most cases it precedes the determination of the qualities essential to success in the vocation. The remaining steps follow in natural sequence.

Some criteria by which the psychological tests may be evaluated are given below. Under no circumstances should the experimenter select a criterion without consulting the executive directly interested in the installation of the tests.

1. Time required to train the employee. In many occupations considerable preliminary training is given the new employee before placing him at work. The cost of this training is usually high, and other things being equal, the sooner the new employee can acquire this information and skill and take his place in the organization the greater the saving to the firm. Where the employee is required to reach a certain level of efficiency before being allowed to enter active service, this criterion may be used and the measure resorted to will be the time required to reach the prescribed level. The experimenter will have to sound not only the prerequisite abilities of the applicant but also his ease of acquiring information and skill.

2. Standings in firm schools. Where the preliminary training takes the shape of training in a corporation school over a stated time interval, the grades received in this school may be used as a criterion for the tests. The instruction is ordinarily of a very practical sort, devoted to the tasks connected with the job, and the criterion becomes the rating of the teacher on the skill which the student displays at the end of the course in those operations essential to the job. When possible, actual measures of this skill should be obtained at the conclusion of the course of study and used in the place of the teachers' estimates.

3. Measures of production. These measures may be the amount sold in the case of salesmen (comparable

with commissions), in the case of operatives the amount of work turned out per unit of time (either by piece work or by the day), or in the case of foremen the amount of work which a whole department is able to turn out. Where salesmen are being compared according to the number of units sold, the experimenter must bear in mind contributory variables such as the difficulty of the territory covered by the salesman, the market for the product in his territory, the extent to which the market has been covered, the competition in his territory, the time the salesman has been on the job, his ability to sustain his sales record, the possible prejudice against him in the particular territory to which he has been assigned, etc. Some executives will have theories as to the type of person who ought to be able to sell for the company and will use special incentives on certain salesmen. The contributing variables are less important with men engaged in routine mechanical tasks. They are hard to neutralize in comparing foremen on the amount which each is able to produce in his department because of differences in size and duties of departments. The most satisfactory measure of production in the case of foremen is probably the average production per man in the department. Measures of production as criteria for tests should be expressed as the average amount produced per unit of time over a long period.

4. Loss due to breakage or claims. This is a good criterion for use with persons who must handle materials which are easily broken or which may be lost or thrown away. Success as a motorman on a street-car may be measured by freedom from accident claims. This criterion may be combined with the preceding one in the case of men who pack up breakable objects.

5. Salary. A man's worth to a firm (and accordingly his vocational success) is apparently paralleled by the salary which that company is willing to pay him. Some of the variables which make this criterion unreliable are length of service with the firm, relationship to some of the company's high executives, the employee's ability to sell the management on his worth, his enterprise in demanding a salary increase, his ambition, etc. If the experimenter is working on executives and salesmen and wishes to measure the individual's ability to get along in the world, many of these variables need not be isolated with salary as a criterion. Unless the management places great emphasis on the given occupation as a source of supply for men for higher jobs, the factors outlined above and others of the same sort may not be ignored. The experimenter must also take into account the various localities in which the men are employed and the relative size of the budgets allowed to each department.

6. Commissions and bonuses. Commissions and income from piece work are better measures of occupational ability than salaries. With compensation on this basis a man's income is usually proportional to his output. The experimenter will be confronted most forcibly with the

problem of motivation and interest when using this criterion. Earnings should be averaged over a long period of time, and the cautions mentioned under "measures of production" should be observed. Bonuses when added to commissions exaggerate differences in ability but do not change the rank of workers in the criterion.

7. Length of service. The firm may meet with little difficulty in locating men who with instruction are capable of complying with the minimum requirements of vocational efficiency, but these individuals may leave the firm so soon as to make the cost of training new men an undue item of expense. The problem for the experimenter becomes one of measuring a certain stability of temperament as well as the ability to do the work required. If he can show that there is a close relationship between length of service and efficiency on the job the problem reduces itself to simpler terms. If there is no relationship between the two, and if tests select the efficient, incentives may be used on them to remain with the company. Frequently the problem finds easier solution in the analysis of the circumstances under which the men leave the employ of the company than in the analysis of their temperament. A check list of reasons for leaving and suggested remedies are given by Bezanson (7)[1] and Benge (6). Too much credence should not be given to the employee's own reasons for leaving, as it may be difficult for him to formulate them, he may wish to leave an opening for a return to the company, or he may rationalize. The foreman's reasons for a large turnover in his department should also be accepted with reservations. If the experimenter accepts the challenge to measure stability of temperament, he must not use as subjects those who left the company for reasons beyond their control. Length of service may have negative value in an occupation considered merely as a training ground. Here brevity of service indicates vocational accomplishment, provided the employee is not discharged.

8. Advancement in the firm. In this case the experimenter selects as prominent successes in the vocation those who have been advanced because of the ability they have displayed in the vocation, regardless of whether or not they have been advanced into positions requiring different abilities. If the management has advanced them not because of the ability they have displayed in that particular vocation but because it considers that vocation as a source of supply for men for more important jobs, the experimenter must consider the abilities of these men with reference to the more important jobs rather than to the source-of-supply jobs. Good examples are men who are required to spend a certain amount of time as shop workmen in preparation for positions as minor executives, personnel men, salesmen, designers, etc. Rapidity of advancement is another factor which the experimenter may take into account.

9. Degree of responsibility. Another criterion is the comparison of the men according to the responsibility

[1] Numbers refer to bibliography at the close of the final chapter.

which they are required to shoulder. This may be related to the number of subordinates they have or to the value of the product they handle.

10. Membership in professional societies. Membership in professional societies entrance to which is based on merit is a legitimate criterion of success. This should include local organizations as well as honorary fraternities and mention in "Who's Who" or "American Men of Science."

11. Ratings. Ratings are less objective than the preceding measures of success and should not be used if any of the others are applicable. Ratings may be made by immediate superiors, by teachers in corporation schools, or by fellow-workmen. Personality is the most prominent consideration in any vocational rating, and unless personality is a factor in success, the ratings will probably be in error. According to Knight (51) length of service of workers will also influence ratings on them. Ratings should receive more consideration as criteria for executives and salesmen than for men engaged in routine tasks requiring manual skill. Objective criteria of manual skill are more likely to correlate with objective performance tests, and ratings are more likely to correlate with tests of personality. Executives who are sceptical about psychological tests will frequently insist on their personal estimate of their subordinates, so that at least one advantage attaches to the use of ratings as criteria, namely, that if a correlation is established between ratings and tests the one man is convinced who is in need of this proof. If ratings are used, the final rating should be an average of the independent judgments of at least three intelligent unbiassed men who are thoroughly acquainted with the persons to be rated. Ratings may cover the one quality of success in the occupation, or they may cover several abilities which are necessary to success in the occupation and are then summed. The safer procedure in obtaining a criterion of success is to ask for ratings on success, using the ratings on component abilities required for success at a later time as checks on the experimenter's analysis of these abilities. A discussion of the forms of rating scales will be found in a later section.

12. Combinations of two or more criteria. If the experimenter believes that any one of these criteria is inadequate to express the employee's vocational accomplishment, there is no reason why several of them may not be combined or averaged. If the measures are of discreet magnitudes they will have to be weighted before averaging so that one criterion will not predominate in the average. If the experimenter believes that he can obtain a better total criterion by weighting each of the contributing criteria in accordance with its judged importance he may do so. Combinations of criteria are probably best expressed in terms of order of merit.

The experimenter may also correlate his tests with each of several criteria which have been shown to be satisfactory. If the criteria are themselves not closely related, the

probability of finding a high correlation between a test and a criterion is enhanced.

The criterion may be expressed in very fine measurements or in a rough three-fold classification of the men. The experimenter may regulate this in accordance with his judgment of the reliability of the criterion.

Having selected a criterion, care should be taken throughout the study to keep it free from the influence of other factors. Some of the disturbing variables which may enter are mentioned in the above paragraphs. The criterion must be adhered to rigidly in selecting the subjects for testing and in determining the traits necessary for success in the vocation.

B. SELECTING THE SUBJECTS FOR THE EXPERIMENT

Of the many considerations which should operate in selecting persons to serve as subjects for the evaluation of the tests, only the more important are listed here.

1. Employees or applicants. The experimenter may be of the opinion that by evaluating his tests on employees of long standing with the firm and presuming to draw conclusions about their use with applicants he is opening himself to the danger of claim that he has measured differences acquired since joining the firm; but he need not be apprehensive. The soundness of his conclusions will be proportional to the lack of technical content in the tests themselves. He may correlate his measures of job proficiency or his tests with extent of experience at the job,—if there is a high correlation it will indicate that the tested ability is acquired with time spent on the job, always with the provision that disturbing variables are nullified. However, even if some of the successful tests are shown to measure abilities acquired by experience on the job, they may still be used on future applicants with the understanding that an applicant who comes to the firm already equipped with these abilities, regardless of where he has acquired them, will be a more acceptable applicant because usually he will require a shorter period of training than those who lack the abilities. All ordinary objections will vanish if the experimenter limits himself to applicants alone for the evaluation of his tests. There can be no scientific objections to test claims based on a correlation between measurements of individuals at the time of application and the standing of these individuals in the criterion as established at a later date.

2. Employees plus applicants. Scott (90) suggested the inclusion among a group of applicants of a "ringer" whose identity is unknown to the examiner. The ringer may be an exceptionally good worker or an exceptionally poor one. In one case he should test high and in the other case low, compared with the group of applicants. No conclusions can be drawn from comparisons of a group with but one individual, and that individual no doubt commonly a man of long experience with the firm and no longer able to adapt himself readily to the test situation. As an extension of this method Scott pro-

posed the comparison in test scores of a group of proved experts with a group of applicants. The joker in this method is the possibility that the vocational failures may also test high; in other words, there is no proved differentiation between the successes and the failures. It does not matter whether the experts as a group get high or low scores, provided the failures are at the other extreme of the distribution, or at least well-differentiated. Which leads us to the next consideration.

3. Sampling. Regardless of whether the subjects are applicants or old employees or both, three well-defined groups of ability should be represented among them: successes, fair ability, and failures. The second group should be somewhat larger than the other two. This distribution of vocational accomplishment among the subjects of the experiment should be comparable with the distribution of this accomplishment among expected applicants, for they are the ones on whom the tests are to be used when evaluated. The range of ability among the subjects should be as wide as possible. A wide range tends to increase the correlation with the tests, a narrow range to decrease it. The experimenter should make certain that all of his subjects have achieved their standing in the criterion by the exercise of those abilities considered necessary for success at the job, and not through chance circumstances or special advantages.

4. Sex. If men and women are both employed in the occupation, it will be necessary to examine the results for sex differences, and if need be, to evaluate the tests separately for the two sexes.

5. Age. Differences in the ages of the subjects should not be so great as to have an influence on their comparative test performances, but if proper sampling does not permit a limited range of ages then some correction should be made for age differences.

6. Willingness to take the tests. No man should consider himself under compulsion to take the tests. If he resists all attempts at persuasion the experimenter will do well to let the matter rest. When the others have been tested the obstinate person will be likely to request an examination.

7. Previous knowledge of the tests. The experimenter should find out whether or not any of his proposed subjects are familiar with the tests or other measuring instruments, and restrict his operations to naïve subjects.

8. Sensory defects. If sensory acuity is a factor in success in the vocation, the fact of sensory defect should be determined for itself in a special examination and should not be allowed to intrude itself on tests for special abilities. The most common sensory disturbances with which the examiner will have to deal are those relating to vision and hearing. The examiner will learn from the job specifications what the occupation demands in the sensory field and if he is testing applicants he will not waste his time testing those who

fall short of this standard. If he is testing old employees it is presumed that all will come up to the standard.

9. Motor defects. Motor disturbances due to lesions or of a functional nature should receive the same attention as sensory disturbances. If occasionally a successful employee is found who suffers from such disturbances, he should be recognized as an exception to the general rule of health among the employees. If the subjects of the experiment are to be representative of the great number, such an exceptional individual may safely be ignored.

10. Literacy. Needless to say, if the tests require a language response no one should be tested who is illiterate. The experimenter will have to make special adaptations of his forms many of his subjects are foreigners.

Occasionally a minor executive whose men are being examined will ask that he also be given an examination. The motive for such requests is largely curiosity. If the executive scores low the results are likely to be disastrous for the experiment. The examiner will find it advisable to turn down all special requests with the statement that since the tests are still in the experimental stage and nothing is known of their value, the scores will be meaningless.

C. DETERMINING THE ABILITIES NECESSARY TO SUCCESS

This step involves the analysis of the occupation with a view to determining the abilities necessary to success in the occupation. The list of abilities is to serve as a basis for devising measuring instruments for selecting employees.

The job specifications will usually contain some psychological requisites, but not as complete a list as the experimenter will need for a working basis. The most complete list of psychological specifications for any vocation is that which Seashore has attempted for singers, but incomplete lists are available for a number of vocations.

1. Sources of information in making a list of psychological specifications. No possible source of information should be overlooked in securing an accurate picture of the psychological requirements for the vocation.

a. The experimenter may actually work at the occupation for a short time and while so engaged make what analyses he can of the abilities he is called upon to use. He should not be known for other than an ordinary workman by his fellows and his immediate superiors. He may thus gather impressions from his fellow-workers which he could not obtain in ordinary interviews.

b. The experimenter may draw valuable conclusions from merely observing the men at work, without doing the work himself. He should not make his presence unduly conspicuous while observing the men.

c. Another source of information is personal interviews with workers of all degrees of proficiency. The experimenter should request these men to give the reasons for their success or failure. If he is able to sift the truth from rationalizations

he will be able to add a few items to his list.

d. The experimenter should also obtain and consult lists of abilities made by executives, foremen, principals, etc., especially from those who have risen from the ranks. He will often find unfortunately that each of these men stresses one ability above all others, either through inability to carry the analysis further or through actual belief in the correctness of his conclusions. By interviewing a number of executives the experimenter will add much to his stock of information. He should under no circumstances make known a disbelief in the analyses of these men. His success in his enterprise will depend on his ability to get along with the men in the firm, and this success will be built on mutual respect. If the experimenter presumes to doubt the opinion of an executive in a field in which he is at home, then the experimenter will have no recourse if others interfere with his work and doubt the wisdom of certain of his steps. If the executive insists on including abilities which in the opinion of the examiner are irrelevant and impossible of measurement, he may call attention to the difficulty of testing for them. Any success which he achieves later will thereby be magnified.

e. Another source of information lies in the conclusions of others who have analyzed the same vocation. These conclusions will be found in the trade literature, in psychological periodicals, or in such general works as Parsons (69) or Blackford (9).

f. The experimenter will likewise do well to consult the various personality schemata and catalogs of human abilities, not so much for the sake of obtaining an indication of what is required for the job he is studying as for making sure that he has considered all possible items. The number of such lists is legion, and only a few can be mentioned here. These are the lists given by Davenport (25), Yerkes and LaRue (121), Wells (114), Webb (113), Allport (1), Viteles (112), Parsons (69), Terman (99), Mendenhall (60), Partridge (70), Bridges (10), Link (54), Meyer (61), Blackford (9), and Roget (79); and in German, by Cimbal (19), Stern (93), and Baade, Lipmann, and Stern (3). The experimenter should cover such factors as manual skill, personality, introversion and extroversion, dealings with persons as opposed to dealings with material objects, interests and motivations, personal and family history, personal appearance, and some of the facts ordinarily obtained in a physical and psychiatric examination.

The final list of abilities should be definite and objective. Where a single ability may be analyzed into several, this analysis should be made. It is not sufficient to state that honesty, perseverance, reliability, personality, or tact are demanded; these demands should be stated in terms of the actual behavior that is desired. Does the secretary have to write tactful letters, or does she have to turn away angry collectors? Does the employee have to be honest in the sense of not telling a lie or in

the sense of not making off with company cash? The more definite the terms of description the more likely is the analysis to be correct; and, furthermore, if the abilities are listed in terms of actual behavior the experimenter can see his way more clearly to the construction of tests. The distinctions often drawn between innate and acquired abilities, and general and special abilities, should be ignored.

2. Evaluation of the list. The experimenter has now collected a list of the psychological and related requirements for success at the job, upon which he is to build tests and other instruments for the selection of applicants. He is uncertain, however, of the accuracy of his list. An additional though not essential step, which follows logically upon the collection of the list of abilities, is the determination of the correctness of the analysis. This is done by incorporating the abilities into a rating scale and having the men who are to be the subjects of the experiment rated on these several abilities by their superiors, their fellow-workmen, or the interviewers. These ratings are then compared with standings in the criterion of success which has been selected. When this step has taken, the results not only furnish a standard with which to evaluate the accuracy of the analysis of the abilities, thereby making the construction of tests more reliable; but the scale may also be made part of the selection program to supplement the tests. Norms will already have been obtained.

The following are some of the forms of rating scales which may be employed for the purposes outlined above (31):

a. Have the judges arrange the men in order of merit, from those possessing the greatest amount of the ability to those possessing the least amount, and assign ratings from 1 to n. In case the ratings are incomplete because all of the judges or raters are not familiar with all of the men to be rated, a final rating for each man may be obtained by the method given by Ream (77). Final ratings may then be transmuted into order of merit ratings. If the ratings are all complete the averages for each man may be obtained and an order of merit arrangement based on these averages. Order of merit ratings may be conviently obtained by writing each man's name on a card and giving them to the rater, who places them in three large groups—good, fair, and poor men—and then arranges the members of each group in order of merit.

b. Have each of the judges select five members of the group of employees, one being extremely high in the ability, another being extremely low, and the remaining three representing intermediate degrees of the presence of the ability. These men should be given ratings of 10, 8, 6, 4, and 2, according to the presence of the ability in them. The judge may then proceed to rate the remaining members of the group of employees by assigning each of them a number from 2 to 10 in comparison

with these five representative employees. This is the Army rating method (74). Its weakness in practical use is discussed by Rugg (81).

c. Assuming 100 to represent the maximum recognizable amount of the ability in any one person, each of the men may be rated in terms of the per cent of this amount that he possesses.

d. Have each of the judges place the employees whom he rates in three groups: the first group containing all those who he believes have a large amount of the ability; the second group a fair amount; and the third group a very small amount. There are several ways of combining such ratings by several judges into a final rating in terms of order of merit or in terms of the original three-group rating. The experimenter may vary this procedure by having the judges place the men in five groups, but he should not ask for a division of the men into merely two groups.

e. The judges may indicate their opinion of the amount of the ability each man possesses by checking one of a number of symbols, as follows:

+!	+	+?	−?	−	−!
+!	+	?	−		−!
Y!	Y	?	N		N!
Y	y	?	n		N

The plus sign indicates a high degree of the ability and the minus sign a deficiency in the ability, and the Y represents *yes* and the N represents *no* in answer to the question: "Does this man possess this ability?"

f. Have the judges rate the men on a graphic rating scale for each ability. A graphic scale consists of a straight line, five or six inches long, under which are from three to five descriptive phrases indicating varying degrees of the ability from one extreme to the other. The straight line represents the range of ability and the descriptive phrases certain representative parts of this range. Rating is indicated by placing a check along the line. These ratings can readily be converted into ranks, or if exact figures are desired, the ratings can be read off as scores by placing a scoring stencil beneath the rating line (31). Below is a sample of a graphic rating scale for one ability.

g. The phrases which form a part of the graphic rating scale may be numbered and placed in a list, and the judges may rate by indicating which numbered phrase describes most accurately the presence of the ability in each employee.

Ratings should be made on each employee by at least three judges who are thoroughly acquainted with the men. These judgments should then be averaged for each employee in order to get the most representative measure of each ability. An

What is his social attitude?

Extremely breezy and informal.	Cordial and congenial.	Meets one half way.	Slightly reserved.	Constrained and formal.

alternative is to assign a man the rating that is given him by two out of three judges, where two judges agree. If possible, the same men should be rated by the same judges at a later date, and these ratings averaged with the original set of ratings.

One constant error in ratings is the tendency for a judge to be influenced in his ratings on the specific abilities of a person by a general attitude or set toward that person, which results in rating him as entirely good or entirely bad. Of course, if the analysis of the abilities essential to success in the occupation were correct, then each of these abilities would correlate highly with the criterion of success, which would imply that these abilities correlated highly with each other but not necessarily with other abilities. The tendency to rate an individual high in everything or low in everything is refered to as "halo" (101), and its presence is indicated by a high correlation of traits with each other. The same data, therefore, which proved the correctness of the analysis of abilities might also prove the error in the ratings. Even though the correlation of each of the rated abilities with vocational accomplishment is fairly high, the intercorrelation of the abilities may be fairly low. Halo is shown by high intercorrelations of obviously unrelated abilities.

Another error in ratings is mentioned by Knight (51). Supervisors will tend to rate old employees high as compared with new employees. The reasons for this as given by Knight are as follows: 1. The supervisor will not admit that being under his direction brought no improvement. 2. The supervisor unconsciously identifies himself with older employees who are perhaps more like him than new employees. 3. The supervisor has become used to the older employees and overlooks their weaknesses.

There are no figures to support the claims of relative advantage of the different forms of rating scales. The graphic rating scale is simple, easily filled out and scored, frees the rater from direct quantitative terms, makes the degrees of the trait concrete, and promotes interest. The following are some of the points to be noted in the construction of a graphic rating scale (31):

Define the ability in terms of what the person actually does, for the more concretely the ability is expressed, the greater is the expectation that raters will agree.

Decide on the extremes of the ability. It is frequently the case that one extreme of a scale may have several opposites.

It will be found good practice to introduce every scale with a question, to which the rating furnishes the answer; for instance, the question, "How tactful is he?" or "Is he tactful or tactless?" may be answered by checking on the rating line. The use of such a general term as tact is permissible here since the descriptive terms in the scale itself give definiteness to the ability.

There should be no breaks or divisions in the rating line.

The line should not be much more than 5 inches in length, so that it may be grasped as a unit.

There should be not more than five descriptive items nor less than three.

The end phrases of the scale should not be so extremely worded as never to be employed.

The phrase descriptive of the neutral or average degree of the ability should be in the center of the scale.

If there are five items, the intermediate ones should be closer in meaning to the center one than to the extremes. This has the effect of spreading the distribution. The same end may be accomplished by making the intervals on the scale larger in the center than at the sides.

Only universally understood phrases should be used. Slang is effective if there is no doubt as to its meaning.

Such terms as *average*, *very*, *extremely*, *excellent*, *good*, *fair*, or *poor*, should be used sparingly. Use in their place adjectives which in themselves express the varying degrees of the ability. In place of *extremely neat* one might say *fastidious*, or in place of *very careless in dress* one might say *slovenly*.

The descriptive phrases should be short and to the point.

The phrases should be set in small type, and there should be plenty of white space between them.

The favorable extremes of the scales in a series should be alternated from left to right so as to do away with a motor tendency to check at one margin of the page.

The evaluation of the list of abilities (incorporated into rating scales) may proceed in the same manner as that employed for tests and other measurements, as well as in the manner described in this section. This procedure is to be described in Section F.

II. The Measuring Instruments

D. SELECTING THE MEASURING INSTRUMENTS

Having formulated to his satisfaction the psychological requirements for success in the occupation, the experimenter is now confronted with the problem of devising means of measuring these requirements in as objective and impersonal a manner as materials are measured. He has analyzed out the abilities required in order to succeed at the job; his problem now is to find a way of measuring these abilities; later he will put these measuring instruments to the experimental test to determine their validity. If the measuring instrument with careful and accurate procedure does not differentiate between degrees of proficiency in the occupation in a manner that may be successfully adapted to employment practice, the error may lie either in the analysis of the abilities required in the occupation or in the attempt to construct tests for these abilities.

The experimenter will not limit himself to any particular type of measuring instrument, but those in which he will be most interested are tests and questionnaires. It is apparent that the measurement of psychological abilities demands a technique quite different from that of physical measurements, even though the two may be made to resemble each other in theory.

This section will present in its larger aspects the technique of psychological measurements as it may be applied to the problem of measuring vocational requirements.

1. General principles relating to the selection of measuring instruments. The following is an account of the outstanding principles to be observed in the selection of measurements. A

later section will deal with methods of constructing these measuring scales.

a. Objectivity. The ideal should be to have a measuring scale which will yield objective quantitative scores; that is to say, the scores will be the same no matter who does the administering or scoring. The tests will be called upon to supplant the method of hunches which is in such common use, a method which depends on unanalyzed general impressions for decisions and recommendations. Depending on his alertness and previous experience—factors which certainly are not constant—the judge or interviewer succeeds or fails in analyzing the abilities of applicants. It has been shown that interviewers differ very materially in their judgments on applicants, for the simple reason that they do not all observe the same things. Each bases his decision on characteristics which he believes important. Even when several interviewers observe the same applicant for the presence of a certain ability they do not agree on the amount of that ability which he possesses. Some men possess the gift of sizing up people with a high degree of accuracy, but these men are rare and command high salaries. No company wishes to be dependent upon the whim of a gifted person who cannot readily be replaced. The experimenter should attempt to analyze the abilities which the successful interviewer is so clever at detecting and construct methods of measuring these abilities which shall be open to everyone.

Objectivity is more feasible in measuring aptitude for routine jobs than for higher positions calling for such intangible abilities as tact, resourcefulness, and originality. To some extent the personal equation is unavoidable in selecting persons for higher positions. It may be advisable to measure the routine or simpler elements of the job objectively and allow personal judgments (with or without the aid of a rating scale) to rule in regard to the more complex factors, even though these may be measured exactly. The personal likes and dislikes of the superiors with whom the new employee is to work cannot be disregarded, and these attitudes vary too much to incorporate them into an objective selection program.

b. Standardization. Growing out of the principle of objectivity is that of standardization. In order for measurements of persons taken at varying times to be comparable, the procedure of the test must be uniform. It would lead to chaos if physical measurements were made by uncorrected scales or rulers which varied considerably with temperature or season. The variations in the standard of measurement must be reduced to the lowest possible point. In the same way the material of which the test is composed, the conditions under which it is given, the directions and time limits, and the method of scoring must always be the same. The test procedure should require very little skill of the examiner and the whole matter should proceed almost automatically, eliminating all possibility of variations in standards due to the efficiency of the examiner.

c. Analogy with psychological abilities. The experimenter should be guided in his selection of tests by their apparent relationship to the psychological requirements for the vocation. If the abilities are analyzed into the actual behavior involved, the construction of tests by analogy will be comparatively simple. This is the method of test construction which has found the widest use, but it is only one of a number. Four methods of test construction are given by Hollingworth (38). The method of the *vocational miniature* involves the reproduction of the entire work or an important part of it on a small scale by the use of toy apparatus. Telephone operators, for example, may be examined by placing before them a miniature switchboard and requiring them to make calls and responses just as if they were before the regulation apparatus. This method does not demand an analysis of the abilities necessary for success at the job, but if such an analysis had been made and such a test used, the test would be classifiable as one based on the psychological requirements for the job, since presumably the miniature apparatus measured these requirements in their totality. This method will be found difficult because of the necessity for the construction of special apparatus. There is a source of error in that the toy apparatus may require finer coördinations and adjustments than are demanded by the regulation apparatus. The second method which we may call the *sampling* method consists in taking an actual sample or piece of the work to be performed and measuring the skill with which the applicant carries out the task. This method is closely related to, if not identical with, certain types of trade testing. It finds a ready use in testing office employees because of the adaptability of some of the office tasks to written test forms. The third is the *analogy* method. Here tests are used "which bear real or supposed resemblance to the sort of situation met by the worker in the given occupational activity. The material is new, but the attitude and endeavor of the worker seem to be much the same" (38, p. 111). This is the method which makes use of the analyzed requirements for the job and attempts to devise measures for these specific requirements. The measures used are not ones which employ the apparatus of the job in its totality, in part, or by a small reproduction, but ones which seem to measure the more elemental or fundamental psychological abilities. Granted that at the present stage of psychological progress we are unable to state definitely just what ability is measured by a certain test and that it is difficult to name the abilities involved in a given vocational task, it is nevertheless true that we can give names to certain types of behavior which are apparent to everyone and we can construct tests which call for the same general type of behavior. A great deal of confusion has been thrown about this matter by assuming that the abilities necessary to vocational success are mental and that any test which fails to reproduce the internal situation cannot be a

just measure of the ability. The experimenter must not forget that what he seeks is an objective measuring scale whose results bear a significant relationship to vocational success. The experimenter cannot claim that the test which he constructs by the analogy method actually measures the ability for which it is intended; but he may claim that a test constructed on such a principle is more likely to correlate with success than any test chosen at random. The last method is one which we may call the *random* method. This method does not rest upon observation nor analysis of the occupation, but uses a large number of tests chosen at random, and assumes that by chance one or more of them will correlate with vocational success. This is the most wasteful and impractical of the four methods. In the examples of this method which Hollingworth cites, most of the tests which proved significant are ones which would have been chosen if the method of analogy had been used; that is, they were tests which bore an apparent relationship to the job. Regarding this method Hollingworth says (38, p. 113):

> It is not pretended that the test is a miniature of the work of such calling, nor that it is a fair sample of such work, nor even that it involves precisely the same mental functions that come into play in such work. The test records and ability in the particular type of work show high positive correlation, which means that an individual who is good or medium or poor in the one is, as a mere matter of fact, also found to be good, medium or poor in the other. Hence, without further analysis, the one may be used as the sign of the other.

The statements contained in the last two sentences may apply with equal truth to any of the four methods of test construction. The correlation with vocational success is the final criterion. The method which has found widest use is that of building tests which call for operations analogous to the observed operations involved in the job. Even those who make use of the random method do not choose their tests entirely at random. This is not to say that the random method, the sampling method, and the method of the vocational miniature have no use whatever.

d. Resemblance to vocational tasks. The preceding section dealt with the materials going into the test. The present section deals with the manner of presenting this material in order to motivate the applicant. The test situation should be made to bear at least a superficial resemblance to the job for which it is intended, as regards its items and mode of presentation. If the analogy method is employed the tests should in most instances be immediately suggestive of the vocational task, but often the analogy may be apparent only to the examiner. If the applicant cannot see the relationship between the tests he is required to undergo and the work for which he is applying, the problem of motivation will arise in the test situation. Any reluctance to take the tests may be forestalled by providing the motivation in the directions or the choice of items; the directions may call attention to the analogy between job and test or they may set up a

hypothetical situation in which the applicant is to place himself, and the items may be so worded or constructed as to pertain more directly to the job without injury to the purpose of the test. To repeat, the experimenter should make it his aim not only to construct his tests with an eye to their analogy with the vocational requirements, but should also motivate the applicant by so wording or arranging his test material or directions as to make their relevancy to the job apparent.

e. Broadness of sampling of measurements. The experimenter will do well not to limit himself in the selection of tests and measurements to the usual psychological tests, although these should occupy the dominating position. Provided the measurement is objective and quantitative and capable of repetition under standardized conditions, it may be taken from any angle of the individual. And here the experimenter should throw aside some of his usual scientific prejudices. Disclosure of the correlation of a series of measurements with success in an occupation makes that series of measurements, regardless of their origin, a matter of concern for the psychologist. Numerous individuals interested in the selection of employees have installed systems with an utter disregard for scientific methods. Scientists have evaluated some of these systems, with results which are not entirely negative. Some of these systems and tests show considerable originality and if applied with scientific care may reward the experimenter. If negative results are the sequel, then the experimenter has a weapon with which to combat the advocate of these methods.

No man, however scientific he may be, is free from conditioned responses to the physical appearance of others, and when the arousal of friendly attitudes in others is a necessity in the job, the physical appearance of the applicant may not be neglected. For this reason the experimenter should make use of ratings on personal appearance, voice, carriage, and other aspects of what we loosely call "personality"—characteristics which have a strong influence on other people and which are not measurable by the customary psychological tests. A list of these aspects of personality is given by Perrin (73). The experimenter may also if disposed try out some of the determinants in the Blackfordian system, either directly or from photographs. He should allow full play to his originality, remembering that it was almost a stroke of genius to make statistical use of the data of the personal history blank in vocational selection.

It is possible here only to enumerate some of the fields of exploration open to the experimenter. In these fields he may make direct physical measurements or employ the technique of tests, rating scales, and questionnaires. In addition to the usual psychological tests the experimenter will derive promising material from ratings made by others on the applicant's appearance and personality, judgments from photographs, anthropological measurements, some of the items in the ordinary medical examination, many of the items in

the neurological and psychiatric examinations, self-ratings by the applicant, items of personal and family history, motives for applying for the position, vocational and miscellaneous interests, attitudes toward current questions, or even the applicant's professed philosophy of life.

f. Innate versus acquired abilities. Since most of the workers with whom the experimenter will deal will be over fifteen years of age, the distinction between innate and acquired abilities may be disregarded entirely in constructing tests. At almost any stage in a person's development his innate and his acquired abilities are hopelessly intermingled. It may even be ventured that the distinction is entirely hypothetical. The experimenter is concerned only with the abilities possessed by the applicant for a position at the time of application. If the man has already acquired the skill through previous experience in the same vocation he comes to the job with an advantage over other applicants, requiring less training before placement. On the other hand, if he has had no experience in the same vocation his ability to handle a sample of the work may be a sign of his future success at the job. In the latter case the measured ability probably approaches more nearly an innate ability. This all amounts to saying that in the absence of verified hypothesis regarding the origin of psychological abilities the experimenter becomes an opportunist.

g. General versus special abilities. The distinction between general ability (general intelligence) and special abilities is enveloped in the same haze as the distinction between innate and acquired abilities. The literature on this topic is of appalling extent, and includes much statistical as well as theoretical material. There are innumerable definitions and interpretations of "general intelligence." Those who have attempted to measure general intelligence have proceded along two lines. Some have used a large number of tests which intercorrelate highly and which presumably also correlate highly with ratings on or objective criteria of intelligence. Others have used many tests whose intercorrelation is a matter of indifference. Since general ability is to be measured, the wider the sampling of abilities the more likely is the resultant total score to be representative. The Binet-Simon test is an example of this second method. In the first method there is no indication that the ability measured by all the tests in common is general intelligence and not a special ability. Furthermore, if the tests really intercorrelate highly there is no reason for using more than one. In the second method low intercorrelations would belie the existence of any common element in the test performances, and the use of such test series involves a waste which may possibly be reduced if the examiner makes a careful analysis. All the researches on the intercorrelations of abilities, whether they prove the existence of a general common factor or not, whether they prove the existence of general intelligence or not, or whether they show the existence of conceptual, mechanical and social intelligences, merely

lead to the conclusion that few tests intercorrelate so highly but that they would show considerable differences in validity if correlated with the criterion of vocational success. The parts of general intelligence tests should be evaluated separately.

2. Sources of test material. The more profitable sources of test material are listed in this section. In addition to these sources, the experimenter may by mere chance run across suitable material for test purposes in newspapers, magazines, and other periodicals, or by browsing in stores or factories. His originality will be shown by his success in adapting these chance discoveries to his needs. In this section we shall deal with some of the sources of completed tests or material from which tests may be constructed.

a. The vocational apparatus. The apparatus or materials used by the worker on the job may often be adapted to test purposes. If the apparatus is costly or cumbersome it will be possible to test only one man at a time. Reproductions of small parts of the apparatus may be used for test purposes, permitting the testing of groups. Sometimes pictures may be substituted for the actual apparatus in testing. Sources for illustrations are textbooks or manuals of the trade, trade journals, trade catalogs, or actual photographs, diagrams and sketches, especially prepared.

b. Former studies of the vocation. It goes without saying that the experimenter should be familiar with all the previous research work on the vocation in question so that he can use positive results and avoid that which proved worthless. Published studies of this sort are to be found in psychological journals, trade magazines, volumes of research, or in miscellaneous publications reference to which may be found in bibliographies. His acquaintance with other research workers often enables the experimenter to learn of results obtained in unpublished studies.

c. General test publications. These need not relate to the vocation which he is studying, but may cover the general field of tests and their evaluation. No matter how well acquainted he is with the field of psychological tests in general, a review of the literature will assure the experimenter that he has not overlooked any applicable tests.

Since psychological tests are an outgrowth of standard laboratory experiments in psychology, it will repay effort to refer to some of the laboratory manuals. Among these are Titchener (108), Myers (68), Sanford (86), Langfeld and Allport (53), Schultze (88), and Scripture (91), as well as numerous untranslated German volumes.

Manuals of psychological tests constitute a second source of information. Some of the best known are those of Whipple (116), Franz (30), Woodworth and Wells (119), Dewey, Childs, and Ruml (26), Pintner and Paterson (75), Downey (27), Ballard (4), Terman (100), Burt (14), Trabue and Stockbridge (111), and Stern and his associates (56, 94, 95). Considerable test material may also be found in Link (54) and Partridge (70), and in the report on Psychologi-

cal Examining in the United States Army (122). A number of volumes on educational measurements and some of the studies published in the *Psychological Monographs* and the *Archives of Psychology* contain valuable test material.

A third source of information is through journals which publish test researches, among which are the *Journal of Applied Psychology*, the JOURNAL OF PERSONNEL RESEARCH, the *Journal of the National Institute of Industrial Psychology* (London), the *Journal of Educational Psychology*, the *Journal of Educational Research*, the *Zeitschrift für angewandte Psychologie*, and the *Praktische Psychologie*.

The experimenter will come across references to valuable material in bibliographies of tests. A number of agencies are at work at present on such compilations. Bibliographies have been made by Mitchell and Ruger (63), the World Book Company (120), Coss and Outhwaite (21), Whipple (116), Muscio (67) and Lipmann (55). The *Journal of Educational Psychology* and the *Psychological Bulletin* occasionally publish short abstracts and bibliographies. In the latter journal Kornhauser (52) has made the most recent and complete abstract. Allport (2) and Cady (15) have also summarized the literature on tests of personality. The most comprehensive bibliography is the yearly *Psychological Index*.

Test literature which has been published without regard for scientific method or evaluation is nevertheless suggestive and may be of worth to the experimenter. Cody (20) and Kemble (47) have published books on tests without giving us much information on the value of the tests.

d. Miscellaneous sources. Under this head we may place all other sources of material for measurements. No other source of test material may be referred to directly, and much will depend on the alertness and originality of the experimenter. Material for ratings on personality and appearance may be found in Perrin (73), Wells (114), Terman (99), Hollingworth (37), Freyd (33); for anthropological measurements in Whipple (116), Yerkes and LaRue (121), Davenport (25), and Wilder (117), as well as in the numerous physical examination blanks for the use of physicians. For some of the items in the medical examination the experimenter may also make use of the medical examination blanks, and for neurological and psychiatric examinations, Meyer (61), Franz (30), and Cimbal (19) give complete outlines. For material for questionnaires on personal and family history, interests and attitudes, etc., the experimenter may refer to Moore (65), Freyd (32, 33), Meyer (61), Yerkes and LaRue (121), Stern (93), Miner (62), Allport (1), Healy (36), and Kemble (47).

3. Principles of test construction. The general principles relating to the selection of tests which were elaborated in a preceding section should be reviewed in connection with the present section. The test must be such that it yields an objective quantitative measure which will not vary with the person who gives or scores the test. The material of the test,

the conditions under which it is given, the directions and the method of scoring should be invariable, so that scores made at different times and places will be comparable. The test should be built up on the theory that it measures one or more of the abilities necessary for the successful performance of the vocational task. The applicant's interest should be stimulated by making the test performance seem obviously related to the job requirements. And, finally, no distinction need be made between innate and acquired abilities and general and special abilities in test construction.

To these principles may be added several others relating more specifically to the construction of tests. The experimenter should make full use of all the material made available to him by other psychologists. He should consult all the sources of test material and adapt to his purposes the technique of test construction as elaborated by others. Above all, he should hesitate before constructing a test if there is already available one which differs from it very slightly. Unless he makes a decided improvement on the test he will accomplish little else than to add to the growing profusion of half-standardized psychological tests.

To the above we may add two more principles mentioned by Whipple. In test construction and administration the experimenter should aim to eliminate all disturbing variables, so that by the exercise of foresight he will be assured of a smooth-running test performance; and he should attempt to control contributory variables, so that his test will call out those abilities which he aims to measure to the exclusion of all others.

An experiment of this sort is similar to a laboratory experiment in psychology, although usually in the vocational experiment the conditions are not so well controlled and introspection is omitted. The experimenter remembering the error to which his measures are subject should beware of too fine a discrimination in test scores.

No satisfactory classification of tests has ever been made, beyond a broad two-fold or three-fold division. This finds its explanation in the fact that a psychological test is merely a sample of a definite sort of behavior, and classifications of human behavior have met with meager success. The most serviceable working hypothesis is to ignore the classifications into tests of general and special abilities, innate or acquired abilities, tests of verbal response and tests of motor response, etc., and to treat the problem simply as this: Here on the one hand is a job requiring the exercise of certain abilities in which people are known to differ; on the other hand is a group of mature applicants whose vocational aptitude or ability is unknown. Can we find some simple efficient measure (test) which will place the men in the same order relative to each other as they will stand in efficiency at the job after a long trial?

The only serviceable hints at classification of tests are the division into those which measure conceptual,

mechanical, or social ability or intelligence (although conceptual may be considered as an adjunct to the other two); and the division of tests, into verbal (oral or written) and performance tests.

Bingham has used the following classification in dealing with tests:

Proficiency tests, measuring ability already possessed.
Trade tests.
Educational tests.
Prognostic tests, measuring aptitude or potential ability.

Toops (110, p. 5) gives the following classification:

I. Tests of proficiency or success in a trade.
1. Verbal.
a. Oral administration.
(1) Army oral.
(a) Oral answers.
(b) Written answers.
(2) Picture.
b. Written administration.
(1) One-word-answer.
(2) Multiple choice.
2. Performance tests.
II. Tests of trade capacity, potentiality, or promise. Sub-classes of this group: Practically every known variety of test, including the above verbal forms, has been used by some investigator at one time or another.

Very little is to be found in the literature on the construction of tests, and yet there is quite a body of knowledge in this field. Some treatment of test construction is to be found in Monroe (64), Toops (110), Chapman (18), Whipple (116), McCall (58), Pressey (76), Scott and Clothier,[2] and in Psychological Examining in the United States Army (122). Perhaps most writers have neglected to record their technique because they consider it merely the application of common sense or a small modification of laboratory practice. Certain rules of test construction may be set down which are based on experience and are probably unique to this branch of psychology. The psychologists who constructed the army mental tests laid down certain criteria for the adaptation of tests for their purposes, which rules are in part applicable only to special types of testing. They are the following (122, p. 299): (1) Adaptability for group use, (2) validity as a measure of intelligence, (3) range of intelligence measured, (4) objectivity of scoring, (5) rapidity of scoring, (6) unfavorableness to coaching, (7) unfavorableness to malingering, (8) unfavorableness to cheating, (9) independence of schooling, (10) minimum of writing in response, (11) interest and appeal, and (12) economy of time. The report from which these criteria were abstracted does not enlarge upon them very much, although the account is the most complete one to be found on the development of a group intelligence scale.

The general principles relating to the construction of vocational tests are given below.

a. Group versus individual tests. The test which is capable of being given to a group of persons at once reduces the cost of the experiment and the time and effort exacted of the experimenter. Cheating may easily be controlled and with the right motivation order is not difficult

[2] Scott, W. D., and Clothier, R. C. Personnel Management. Chicago, 1923.

to preserve. A large room equipped for the purpose is almost a necessity. If the test requires expensive apparatus it may be impracticable to obtain sufficient sets to make group testing possible. In general, group testing limits the variety of reactions that may be studied. The individual test, the test given to one person at a time, requires more of the experimenter's time, but permits of more elaborate apparatus and a greater variety of reactions. In theory some importance may attach to the distinction between the two types of tests in so far as they differ in reproducing the job conditions; that is, if the job requires the men to work together in groups, then in theory the group test may be advisable, and if they work singly, then in theory the individual test may be preferable. An individual test which sets a given task and is scored in terms of the time required to complete the task is called a "work limit" test, and a test which takes account of the amount of work done in a given time is called a "time limit" test. In group testing only the second form is recommended, since it is not easy to time the individuals in a group separately. There is usually a starting signal and a stopping signal, and the papers or other apparatus are scored in terms of the amount accomplished (or the amount accomplished correctly) within the given time. A group test may be used for individual testing, but the opposite is not ordinarily possible. Some schemes have been devised for the purpose of adapting individual tests to group procedure by timing the members of a group on a set task, but these schemes are open to error and depend in part on the honesty of the persons tested.

b. Types of test items. This section will deal with the construction of items for verbal tests, performance tests, questionnaires, and rating scales. Spoken responses should be avoided because of the difficulty of recording and scoring. In written responses the amount of writing should be reduced to a minimum because of the time required, variations in speed of writing, illegibility of handwriting, and difficulty of scoring. All test items should be explicit and in the vocabulary of the men in the occupation. In each case there should be no doubt as to the right answer. Catch questions should be avoided. Questions should not overlap so that one suggests the answer to another. Test or questionnaire items should be printed so that answers are indicated in a column near the edge of the sheet to facilitate scoring.

Verbal tests require either a spoken or written reply, and call for knowledge of a particular field. The following is a classification of verbal test items by responses.[3]

A. Free response.
B. Constrained response.
   1. In wording of question.
   2. In location of answer on page.
   3. In selecting answers.
      a. Multiple choice.
      b. Two choice.

The free response or essay test places no limitations on the type of

[3] This classification is the suggestion of Dr. L. L. Thurstone.

response which may be made. It consumes a great deal of time in answering and is very difficult to score. At best it cannot be scored as objectively as some of the other forms. It may be valuable in selecting secretaries who can write tactful letters, but it would be difficult to score a letter on tactfulness. In the single word trade test the response is free but the answer is considered correct if a certain word is mentioned in the response.

There are three types of items calling for constrained responses, varying from the least constrained to the greatest.

Some questions may be so worded as to require the answer in certain definite units or to place other limitations on the response. If a question is worded: "How far is it from New York to Chicago?," no constraint is placed on the response. But if it is worded: "How many miles is it from New York to Chicago?," constraint is placed on the response by requiring it to be in miles. In the *free association test* the person is given a stimulus word and told to give in response as quickly as he can the first word it suggests to him. No constraint is placed on his response. But the directions or wording of the test may place constraint on him by requiring him to give the opposite of each stimulus word.

So far the questions do not specify a written or spoken response. The individual may be further constrained by requiring him not only to write his response but to put it in a definite part of the page. Examples of this form are "From New York to Chicago is —— miles," (known as a *completion test*), and "How far is it from New York to Chicago? —— miles."

Still greater constraint is placed on the response when instead of allowing the subject to state or write his response, he is asked to indicate which of several responses is correct. If the number of alternatives is more than two the test is called a *multiple choice test.* An example is: "From New York to Chicago is 253 540 912 1164 miles. (Underline the correct figure.)"

The greatest constraint is placed on the response when the subject is required to choose between two alternatives, as "From New York to Chicago is 1061 miles. True False (Underline one.)"

As greater constraint is placed on responses the objectivity of the examination increases but the reliability of the separate items decreases. In almost every way the two-choice response is more objective than the free response. The two-choice response is free from the difficulty of scoring and the large variety of answers that one encounters in free responses. On the other hand, however, a single response if free has greater reliability as a measure of information, mainly because the two-choice form allows of guessing and usually the single items cover a very small field. Consequently, as more constraint is placed on a person's responses to questions, the number of questions or items in the examination should be increased to gain reliability. The experimenter should strive to

obtain objectivity by placing constraint on the individual's responses and yet to retain reliability by allowing some freedom of response or by increasing the number of items. The happy medium is probably in responses of the type B2 or B3a, with not less than fifty items to an examination.

Certain forms of test presentation have proved very popular. The multiple choice test with its many variations is one of these. The usual number of alternative answers is four. They may be placed within a statement as in the example given above, or they may be placed after a question as alternative answers. The incorrect answers should be chosen for their likelihood of confusion with the correct one. In the *analogies test*, which is a form of multiple choice test, each item consists of two ratios, as A:B::C:D, E, F, G. A, B, and C are given and are supposed to be known by the subject. He is instructed to check the one of the four last terms which bears the same ratio or analogy to C as B does to A.

The completion test in a variety of forms is used often and although difficult to score is valuable in measuring special information. Not more than one word should be supplied in a blank space, and if possible there should not be more than one missing word in a sentence or clause.

A certain field of knowledge may be tested by listing a number of technical terms in use in that field. Among them should be some terms which do not belong in that field. The subject is instructed to check the items belonging to the field of knowledge on which he is being examined.

Free and controlled association tests may be used in a great variety of ways in vocational testing (119). Whipple gives a full account of their uses and interpretations of the functions which they measure (116). They may be used in measuring special information by listing a number of objects and requiring the subject to name the whole of which they are a part, or the use to which they are put, that is, to express in one word the field of their use. Some uses of the free association test are given in Kent and Rosanoff's monograph (48). The word naming test, in which words are named as rapidly as possible for a given period, forms a part of the Terman-Binet intelligence tests, and is also to be found in Whipple. It is impossible to give in this discussion a full account of the various forms of association tests, and the reader is referred to the sources of test material for further information.

The test may be in the form of pictures of various objects or processes in which important parts are lettered. The subject is instructed to give the names of the lettered parts. All the names may be listed beside the picture and instructions given to place the proper letter before each name.

Similar pictures may be used giving the whole apparatus, each part being lettered, with instructions to indicate what would happen at y if x were moved.

Pictures or descriptive phrases may be arranged in series representing

steps in a certain continuous technical process. They are then disarranged and the subject is to place them in order.

A variation on the above is to require the subject himself to supply the last step in the process.

Directions tests are not concerned so much with content as with the ability of the individual to carry out complicated instructions. There is no limit to the possibilities of directions tests, and they seem to be good measures of alertness. Examples are to be found in the army report (122) and in Woodworth and Wells (119).

It would be beyond the scope of this outline to give a complete summary of all the possibilities in verbal testing. We have pointed out where the different types of test material may be consulted. Some of the additional methods of construction are seen in the number series completion tests, synonym-antonym, cancellation, X-O, vocabulary, naming what is wrong in a picture, memory span, memory, word-building, disarranged sentences, report tests, etc. The following references will cover pretty completely the varieties of verbal test construction: 1, 8, 14, 18, 30, 38, 48, 54, 64, 76, 100, 111, 116, 119 and 122.

Performance tests call for a motor reaction rather than an oral or written response involving language. They require some sort of mechanical apparatus and are usually administered as individual tests. No general rules regarding their construction may be laid down, aside from the general principles that have been emphasized on previous pages. Performance tests may consist of merely one step or process, the score being in terms of the time required to complete this process; or they may consist of a number of units, the score being either in terms of time required or number of units completed within the stated time. The apparatus should be of sturdy construction, and easily replaced. It is advisable to have an extra set for emergencies. Laboratory manuals for experiments in psychology will be the most fruitful source of information on the technique of performance tests, and the job apparatus will suggest materials. Some well-known performance tests are tests of card-sorting, steadiness, tapping, picture completion, form board, maze tests, construction of a mechanical object when the parts are given (Stenquist test), and the newer tests of personality in which a social situation is set up by making the experimenter an integral factor in the apparatus (27, 66).

Questionnaires are not intended to measure an ability directly but to gather information regarding those elements of the individual's personal and family history, interests, motives, and personality, which cannot be obtained in other ways. Needless to say, questionnaires should not be timed, since speed is not an important factor. They need not be completed at the time of examination, but may be filled out at any convenient time. Any single questionnaire should not be very long. If much information is desired several questionnaires should be constructed. The questions should be brief and to the point, and the amount of

writing required should be a minimum. Where only a few alternative answers to a question are conceivable these answers may be printed and instructions given to check the right answer. If a question can only be answered by Yes or No, the letters Y and N may be printed after it and the answer indicated by encircling one of these letters. If the same question is to be asked concerning a long list of topics, space may be conserved by printing the question once, followed by the list of topics, so that each topic stands for a complete question. Ease of handling the data may be attained by providing that answers be indicated in a column at the right hand margin of the page. The questionnaire should be preceded by instructions and a statement to the effect that the material will be considered confidential. It will be impossible to eliminate falsification, but the questions may be so worded as to make the most profitable direction of falsification open to doubt, increasing the probability of getting true information.

Rating scale construction has already been discussed. The same scale which was used in evaluating the list of psychological specifications may be used as a means of selection. The rating scale may be used in the same way as a questionnaire by asking the subject to rate himself. If the rating scale or questionnaires ask for information of an intimate nature, it will be advisable not to require the subject to write his name on the blank. The blanks can very easily be keyed so that they may be identified later.

c. Representative value of the items. The individual items of which the test is constructed should be representative samples of the type of behavior it is desired to measure. All superfluous items, all items which do not seem to measure just this ability, should be excluded, and those that are retained should be a fair sampling of the ability or information, as regards both variety and difficulty. Items should be avoided which have only a temporary interest and are apt to become out of date.

d. Order of items. Unless all the items in the test are of practically the same difficulty, they ought to be arranged in order of difficulty. The relative difficulty of the items may be determined by finding the per cent of a group that is able to solve each one correctly, or by taking time on each item. The preliminary order may be based on the judgment of the experimenter. If the easiest items are placed at the beginning of the test, the subject has little difficulty in becoming adapted to the test requirements and a better distribution of scores is obtained. A number of very difficult problems at the beginning of the test may discourage some subjects to the point where they will refuse to continue, whereas those who are able to complete these difficult problems find the sailing smoother with the easy problems which follow. This results in a difference in scores which exaggerates differences in ability. In multiple and two-choice tests, the position of the true answer among the alternatives should be determined for each item by lot.

e. Length of test. The length of the test should be based on the necessity for having a good sampling of the ability and for having a reliable

measure. These two amount to the same thing, and mean that the larger the sampling of the ability the more accurate the resulting score as a measure of that ability. This will depend to some extent on the objectivity of the test items. The law of diminishing returns holds good in connection with the length of a test. The first few items are the most important. Additional items increase the validity of the test, but much less in proportion. It is better, however, to err on the side of having too many items than too few, since the validity of each item may be determined and the test then reduced to include only those items which show the greatest vocational predictive value. The test may also be shortened by correlating scores made in a part of it with scores made in the whole test. Any part of the test which correlates .90 or more with the whole test may be used in place of it.

f. Time limits. A time limit is not essential to a test, since it may be scored either on the time required to complete the given task, or on accuracy alone. But there is no point in allowing a person to fumble over a task for several hours when it is perfectly obvious that he will not be able to accomplish it, or that if he does, he will score very low. A time limit which is set for convenience aims to meet this situation, and not to measure speed. Accuracy in the task is the variable which the test aims to measure. The time limit is set so liberally that all but a very small per cent (about 5 or 10 per cent) are able to complete the task. On the other hand, if it is necessary to measure speed, the time limit is set so low that only five or ten per cent of the group are able to complete the task. Speed is then measured by the number of units completed in the given time. The time limit should not be set at such a point that no one is able to complete the test. Most persons who take psychological tests are under the impression that they ought to finish the test within the time limit, and only a great amount of elucidation will convince them that such is not the case, and that the important thing is their rank relative to the others who take the test. The time limit may be determined by preliminary trial with a few average subjects, or it may be determined in a group by calling time when 5 or 10 per cent (or 90 or 95 per cent, depending on conditions) seem to have finished. This time limit, of course, should be rigidly adhered to hereafter.

g. Directions for giving the test. The directions should be brief and simple. They should be worded in accordance with the educational level of the subjects. To make sure that the directions are understood, several examples and solutions may be given. It is more important to make the directions absolutely clear in group testing than in individual testing, for time cannot be taken out if questions as to procedure arise. The directions may either be given orally or presented on printed sheets with the test, or both. They should not be on the same side of the sheet as the printed test, as that allows the rapid readers to solve some of the problems before the starting signal is given. They should preferably be on the back of the sheet, and at the starting

signal the subjects turn the sheets over and commence to work. Instructions should be given to cross out mistakes instead of erasing them. Important statements in the directions should be in capitals. If speed is not desired, the starting signal may be merely, "Go ahead," but if speed is desired, the suggestion can be given by saying, "Ready? Go!." The stopping signal may be "Stop" or "Pencils up." Some examiners have made use of a bell as a starting and stopping signal. The directions should be given a preliminary tryout with a few subjects to see if they are perfectly explicit and fool-proof, but even with this precaution it will be necessary in most cases to make further modifications. The directions should be so worded as to motivate the subject if the test performance does not seem to be related to the job. Do not refer to the test as a "test"; call it something else, such as "form" that will be less likely to make the subjects nervous. Instructions for administering trade tests are given by Chapman (18).

h. Directions for scoring the test. Speed and objectivity should be basic in deciding upon a scoring method. The score should be simple, capable of being obtained quickly, and precise. It must not be subject to variation because of the personal equation of the scorer. Stencils of various sorts which may be laid over the test or alongside it are great aids to scoring. Some of these stencils are opaque except where answers are to be inserted in the test. These have the disadvantage that they may hide an answer in the wrong place. The totally transparent stencil is preferable. There should be a convenient place on the test to record the score, or a card should be at hand on which each person's score may be recorded. Below are some of the ways in which a test may be scored.

Time required to complete the task.

Number of units completed (regardless of accuracy) within the given time limit.

Number of units completed correctly.

Number of errors, or number of units completed incorrectly.

Number of units completed correctly minus the number completed incorrectly.[4]

[4] This is the customary method of scoring tests where only two possible answers can be given to each question, and is supposed to eliminate or reduce the effect of guessing. It is assumed that if a person goes through the test and indicates his answers at random, or by guessing, he will get half of the problems correct. If the number wrong is subtracted from the number right, his score will be zero. He will get zero for those problems which represent mere guesses, whereas those which he knows will all be assigned positive credit, since there will be no wrong ones for which to deduct credit. In theory this method of scoring eliminates the factor of guesswork. It is true that by guessing, a score of zero on this basis will be more probable than any other score, but the majority of scores obtained by guesswork will not be zero, just as in a normal distribution curve the median score is the most probable score, but those who get that score are not a majority of the total number. Because of individual variations in guessing this method of scoring may be unfair. The only recourse is to increase greatly the number of items. The greater the number of items in a two-choice test, the more restricted the range of scores that can be obtained purely by guessing as compared with scores representing knowledge. Thurstone (107) gives an exact method of arriving at a proper weighting of right and wrong answers.

The number of times a standardized prompting must be given in order to make the individual carry on the task to its successful completion.

Difference between true values and guesses or estimates which the subject is required to make.

Various ratios may be used, such as the ratio of an estimate to the true value, the ratio of one score to another, or the ratio of scores in one part of a test to scores in another part.

Correlation with true order may be used as a score if the subject is required to place a number of variants in their true order.

Some tests have been scored by rating scales; that is, the examiner observes the type of response and then by reference to a table obtains the score which is assigned to that type of response. This method lacks objectivity, but no one has determined just how much error exists in it. For certain types of responses it is the only scoring method possible.

i. Omnibus tests. If accurate timing is not essential, and if the difficulty of administering the tests must be reduced, a number of tests may be combined into an omnibus test. In this form the items of a number of different tests are intermixed to form the body of the omnibus test, and the directions for all of them are assembled at the beginning of the test. The subject is given a definite amount of time to master the directions for the different kinds of tasks. He is then allowed to work on the omnibus test until time is called. This form of test saves time and labor in administering, and has found a fertile field in intelligence testing. The customary procedure is to obtain a total score on the whole test. If the experimenter makes use of an omnibus test he should obtain separate scores for the various types of items as if they were separate tests. Omnibus tests introduce the factor over and above the ones measured by the individual tests of which they are composed, that quick shift of attention from one type of performance to another is demanded of the subject. If the various types of items recur at regular intervals without increasing in difficulty, the test is called a *cycle omnibus test;* if the items recur at regular intervals and increase in difficulty the test is called a *spiral omnibus test.*

j. Alternative forms. Use has been made of alternative forms of tests in order to reduce the possibility of coaching or cheating. These forms should be equal in difficulty and should correlate very highly (over 0.90) with each other. The best procedure for devising alternative forms of a test is to divide a large list of acceptable items into several piles purely by chance.

k. Arrangement in series. If a battery of tests is to be used, they may for convenience be fastened together or printed in booklet form. If this is done, the arrangement should be such that only one test appears at a time, the easiest tests at the beginning, and the rest of the tests in order of difficulty. Those tests which do not require speed may be placed at the end, so that the booklet may be handed in when completed. Care should be taken to

see that no one turns back to a preceding test.

4. Determining the functions measured by the tests. This is a step that may be omitted, since the important point to determine is the correlation of the test scores with the criteria of success. If this correlation has already been determined, or if the examiner is anxious to know how accurate he has been in constructing tests by the analogy method he may proceed to correlate his tests with ratings obtained in the manner outlined in Section C2.

To be continued

News Notes

A CHANGE IN EDITORSHIP

Announcement is made with the keenest regret that, owing to continued ill-health, Leonard Outhwaite has resigned the editorship of the JOURNAL OF PERSONNEL RESEARCH. Since the JOURNAL was established nearly two years ago, Mr. Outhwaite has worked without stint for its upbuilding. To him is due in large measure the excellence which the JOURNAL has exhibited in both subject-matter and attractiveness of make-up.

W. V. Bingham, of Carnegie Institute of Technology, has been elected Editor and L. L. Thurstone, of the Bureau of Public Personnel Administration, associate Editor of the JOURNAL. C. S. Yoakum continues as Managing Editor, in charge of Book Reviews, Abstracts and News Notes. The other members of the editorial board are Wesley C. Mitchell, Alice Hamilton, Frankwood E. Williams, R. W. Husband, Matthew Woll, Leonard Outhwaite, Joseph H. Willits, Lewis M. Terman, Alfred D. Flinn and Mary Van Kleeck.

The JOURNAL OF PERSONNEL RESEARCH, devoted to the scientific study of personnel, will continue to publish original researches in the applied sciences that contribute to our knowledge and our effective direction of people at work. As the official organ of Personnel Research Federation, its purpose is the furtherance of research activities pertaining to personnel in industry, commerce, education and government wherever such researches are conducted in the spirit and with the methods of science. It brings together workers in the biological and medical sciences, psychologists, psychiatrists, engineers, economists and labor leaders who are making significant contributions to more exact knowledge of human beings at work and of methods of making effective and satisfying adjustments between men and their work.

CALIFORNIA BUREAU OF JUVENILE RESEARCH DISCONTINUED

The California Bureau of Juvenile Research, the central laboratory of which has been at Whittier State School, was discontinued on June 30th, 1923, in consequence of the retrenchment program of Governor Friend W. Richardson. The Bureau began in 1915 as a department of Whittier State School, under the direction of Dr. J. Harold Williams, who remained in charge until its discontinuance.

In addition to its work at Whittier State School, the Bureau maintained branch laboratories in several other institutions, made psychological surveys of public schools, and conducted training courses for social workers. The staff consisted of ten members.

The publications of the Bureau, including the Journal of Delinquency and a series of bulletins, were discontinued with the Bureau. The Journal, "devoted to the scientific study of problems related to social conduct," has been published bi-monthly since March, 1916, and was the only periodical in the United States limited to this special field.

ANNUAL MEETING OF AMERICAN CONSTRUCTION COUNCIL

The first annual meeting of the American Construction Council, following the organization meeting that took place in Washington in June 1922, was held in New York City on Friday and Saturday, September 21st and 22nd, 1923. At its sessions some of the most pressing problems awaiting solution by the industry received practical consideration.

The meeting of the Council itself, following a meeting of the Board of Governors at the home of President Franklin D. Roosevelt in the morning which was attended by 35 members of the Board and the public,

was opened by a note of welcome from President Roosevelt in which he expressed his faith in the great usefulness of the Council and its field of constructive activity for the future, which was read before the Council by Vice-President John E. Lloyd of Philadelphia.

Mr. D. Knickerbacker Boyd, serving as general chairman, delivered an address as executive Vice-President of the Council in which he reiterated the purposes for which the Council had been formed and the major lines of activity along which it should operate.

Among the problems discussed were Local Autonomy and National Organization in the Construction Industry (How the American Construction Council should aid in the promotion of and coöperation with local building congresses); Apprenticeship, Vocational Guidance and Craftsmanship in the Construction Industry; Reduction of Unemployment in the Construction Industry; the American Construction Council's Program on Research; and What the American Construction Council Can Do to Help the Various Branches of the Industry.

Apprenticeship, Vocational Guidance and Craftsmanship received concrete presentation by Fred F. Moran, Managing Director of the Apprenticeship Commission of the New York Building Congress; Dr. J. C. Wright, Director of the Federal Board for Vocational Education; George Dautel, Chairman of the Apprenticeship Committee for Bricklayers, Cleveland, Ohio; James M. Gauld, Vice-President of the Boston Building Congress; and Col. F. M. Gunby of the Boston Building Congress, and others.

Reduction of Unemployment in the Construction Industry received attention through a paper by Mr. A. P. Greensfelder, Vice-President of the Associated General Contractors of America, St. Louis, and an address by Dr. John M. Gries, Chief of the Division of Building and Housing of the U. S. Department of Commerce.

In each case there was open discussion from the floor, participated in by numerous other persons, and the appropriate committee of the Council itself made announcement as to the activities and plans of the Council for action along the respective lines, among which was the report of Mr. F. W. Walker, Chairman of the American Construction Council's Committee on Apprenticeship, Vocational Guidance and Craftsmanship, and the report of Mr. D. Knickbacker Boyd, Chairman of the American Construction Council's Committee on Seasonal Unemployment. Rotating chairmen were chosen to preside for each topic, Dr. J. C. Wright of the Federal Board for Vocational Education presiding for the subject of Apprenticeship, and W. E. Welch of the American Society of Safety Engineers presiding for the subject of Reduction of Unemployment.

Indicative of the Council's affirmative action along some of the more important lines are the resolutions passed at the annual meeting of the Board of Governors, held in conjunction with the meeting of the Council itself, which are, in part, as follows:

Apprenticeship

With the desire of furthering a sound and adequate program on apprentice training for the construction industry and of cooperating in every way possible with the present bodies who are directing their efforts in this field, and who are or in the future may be, inaugurating and conducting agencies for such training, the Board of Governors of the American Construction Council hereby requests the officers of the Council operating especially through its Committee on Apprenticeship, Vocational Guidance, and Craftsmanship, to coöperate with employees' and employers' organizations, building congresses, and all other elements in the construction industry, and with the educational bodies, local and national in providing for apprenticeship which will be attractive to young men and will afford the fullest means for the employment and training of efficient workers as apprentices, and will produce the skilled workmen needed in the construction industry; and the Board further authorizes as the first essential step in this program the making of a national survey on apprenticeship needs and conditions of labor supply throughout the construction industry and

through the appropriate agencies of the Council coöperating with all organizations within the industry.

Statistical Program

Earlier in the year the American Construction Council called attention to the necessity for securing at regular intervals adequate data that would give the public information which it could use as a barometer of present and anticipated volume of construction by important districts throughout the country. By securing such facts it is the thought that the peaks and valleys in construction activities, which have effects of such a serious nature upon every person in any way connected with the industry, either in contemplating and executing a project or as an owner, would by careful planning be reduced in so far as possible.

The Board of Governors authorizes and directs its Executive Committee to keep in touch with conditions pertaining to construction throughout the various districts of the nation, and if in its judgment a crisis arises in construction activities, to convene as many members of the Board as possible and issue a statement to the public for its information regarding same, recognizing in its action conditions applicable to the different localities.

COURSE IN STRIKE PREVENTION

"The Human Equation in Strikes" might well be the name of a new course on Labor and Employment which is being offered at New York University this year for the first time. Mr. J. D. Hackett, an experienced consultant on labor problems for many large manufacturing concerns will have charge of the Course.

According to Mr. Hackett the need in industry today is away from machinery and towards the mechanics of handling the worker. This is essential, he points out, if the employer wishes to keep his men on the job and at the same time secure the greatest output.

"The recent coal and pressmen's strikes called attention to the prevalence of labor disputes in our great and vital industries," said Mr. Hackett. "It is useless now to speculate as to whether they could have been avoided by offers of the same terms before the strikes took place. What we need is insurance against the future. This can only be accomplished by educating the employers in the ways and means of avoiding strikes and labor disputes."

LOS ANGELES DIAGNOSTIC CLINIC

The Los Angeles Diagnostic Clinic for Neuro-Psychiatry and Psychology has been recently organized under the direction of Dr. Aaron J. Rosanoff, formerly Director of Kings Park Hospital, New York, and Dr. J. Harold Williams, formerly Director of the California Bureau of Juvenile Research.

It is the purpose of the clinic to "provide complete service in the nature of diagnosis and therapeutic recommendations in cases in which the resources of mental science can be of benefit."

"Persons presenting problems of social adjustment or deemed to be suffering from psychoneuroses, psychoses, neuro-syphilis or other disorders of the nervous system may be referred for diagnosis. Difficulties or behavior anomalies arising from mental deficiency or temperamental deviations also fall within the scope of this clinic."

"In addition to dealing with individual cases, the Clinic undertakes to make psychological surveys of schools, business and industrial plants, and other personnel groups."

A consulting staff of twelve medical and surgical specialists has been announced.

Book Reviews

HUMAN CHARACTER

By Hugh Eliot. Longmans, Green & Company, New York, 1922. 272 pp.

REVIEWED BY R. F. LOVETT

This is a valuable coördination of the modern psychological principles underlying human character, together with a large number of the author's observations on the subject. The chief divergence from the usual treatment is that the intellectual differences are subordinated to the differences of emotion which are presented as having the major rôle in the moulding of human character.

Following the first chapter on General Principles, are chapters titled, The Major Passions, Egoism, Love, Social and Moral Feeling, Jealousy, Religion and the Minor Emotions. Further indication of the content of the book is obtained from the terms, Bovarysm, Suggestion, Obsessions, Fanaticism, Genius and Disease, which, though treated in rather anecdotal method are, nevertheless, stimulating reading.

The book is rich in quotations from Belles Lettres illustrating the author's points in a helpful manner. It is unfortunate, however, that the sources of the facts on many controversial subjects are not included. Had this been the case the book would have been of infinite value as a guide in the searching studies now being made into human character. In its present form it is an important contribution to the literature on the subject.

BRITISH AND CONTINENTAL LABOR POLICY

By B. G. De Montgomery. E. P. Dutton and Company, New York, 1922. 575 pp.

REVIEWED BY PAUL H. DOUGLAS

This is an excellent comparative study, by a student of conservative temper, of the labor movements and labor legislation of Great Britain, France, and the Scandinavian countries. The underlying economic conditions in each country are first outlined and a succinct account of labor's activity in the field of political action and of trade-unionism is then given. Following this, the legal position of the trade unions in the various countries is clearly analyzed, followed by chapters on conciliation and arbitration, the minimum wage, the legal regulation of the hours of work, unemployment, joint industrial organization, and the nationalization of industry. Each of these topical chapters concludes with a section comparing the situation in each of the countries treated.

While the work betrays, here and there, some bias, it is on the whole quite an extraordinary mine of information. While it lacks the penetrating grasp of the Webb's *History of Trade Unionism*, it nevertheless brings together within convenient compass a full statement of the recent history and

policies of the British labor movement. Its chief merit, in the eyes of American readers, however, is its full treatment of the labor situation in France, Denmark, Norway, and Sweden. Aside from Levine's brilliant essay on *Syndicalism in France* and occasional articles in the *International Labour Review*, M. De Montgomery's work stands almost alone in the field and deserves to be read by all who would understand the working forces in the economic life of these countries.

One of the most interesting features of the work is the description of the method by which the eight hour day has been almost universally obtained by governmental legislation in France, Sweden, and Norway and by agreements between the unions and the employers associations in Great Britain and Denmark. Definite proof of the effect of the reduction in hours upon output is lacking for all the countries save Sweden, although M. De Montgomery believes that it has resulted in an appreciable decrease. He admits, however, that "the health and enlightenment of the people and the removal of the causes of discontent among the workers are all factors which, in the long run, form the loss in production."

The author opposes an extensive system of public works at previous wage rates which he thinks would absorb the surplus of men and prevent wages from being cut to their "normal" or competitive level, thus serving to prevent costs from falling to the point where they may meet the lowered money demand for goods. He also objects to making money payments to unemployed workers and declares that what they need is work at adequate wages and not grants for idleness. He proposes therefore that the government should require every employer to maintain in his factory "a certain number of workers—which number must be under no circumstances reduced—at full *real* wages."[1] To do this, however, will necessitate the employer's insuring himself "against loss arising out of trade depression." He should therefore pay periodical sums, graduated according to the number of his employees, to a central fund, governmentally administered, which "should be applied in case of trade depression—to assist the employer in maintaining the number of hands in his factory and real wages at their normal level."

While these are suggestive proposals, the author does not seem to have considered the fact that perhaps the chief cause for the inception and continuance of trade depressions is not so much an inability to reduce costs, as it is a break-down in purchasing power. Relief work and unemployment payments by giving fresh purchasing power to the workers to lessen the cumulative decrease in demand might, if promptly administered, largely check the downward movement of business. The guarantee of full employment, at regular work which M. De Montgomery proposes as a substitute for present methods might fulfill the same purpose. He has not, however, grappled with the difficulties of apportioning the allotment of a country's labor among the myriad establishments so that all the workers may be cared for. This problem would be enormously complicated by the secular increase of population. It seems indeed that in this instance, the author has jumped from the frying-pan into the fire.

Taken in its entirety, this is an extremely valuable contribution and should inspire some one to prepare a similar work on Germany, Belgium, The Netherlands, Spain and the countries of Southeastern Europe.

[1] Author's italics.

HUMAN FACTORS IN INDUSTRY

By Harry Tipper. Ronald Press Company, New York, 1922

REVIEWED BY MARION A. BILLS

Describes from the historical and sociological side the present attitude of capital and labor. Three main aspects of this attitude stand out as one reads the book. First there has come a separation of industrial and moral obligations due to the massing of large numbers of people in factory towns and the withdrawing of the employers' close contact with the employees. This loss of the feeling of obligation has been suffered equally by the owner and the laborer—both indulge in actions that as separate individuals in direct contact with each other neither would tolerate. Second, specialization and education have been working in opposition. As the highly specialized machinery has been introduced the operations performed by the individuals have taken on a routine and deadening nature. On the other hand education, while in no sense as yet adequate, has tended to train the individual to think for himself. This makes him feel more than ever before a deep-seated unrest when obliged to do the monotonous work. Third, the workers have lost the sense of leadership that existed when the employer was a supercraftsman among them. As the functions of the two have separated the laborer has been unable to see and appreciate the real work and energy of the man taking the responsibility of a venture and planning its development. The average foreman, who in most cases represents the employer to the laborer, since he is not trained on the executive side has in too many cases become a driver, not a leader.

Trade unions and employers' associations have grown up as a solution for the economic problems that arose out of these attitudes of mind. The author traces the history of trade unions in an interesting and fair-minded way. He believes that they were the only solution of the problems arising out of the lack of the moral responsibility of the employer which made collective bargaining necessary, but he does not believe that they are the final solution of the industrial situation that now exists. He outlines with some detail three plans which have met with varying degrees of success. These plans are: (1) The conference system, (2) the works committee plan, and (3) the house and senate plan. He also outlines in general terms the fundamental principles that must be observed in putting into effect profit sharing plans. He makes a strong plea for fitting the job to the man, not the man to the job. For example, he suggests that a man follow one complete operation through rather than do a small portion of that operation many times.

In reading the book one cannot but feel that the author looks back with a bit of regret to the "golden days" before big machines were introduced. He has perhaps idealized working conditions of the older times. His suggestions for improvement tend to be suggestions of reversion. He has, however, hit a fundamental truth and driven it home with repeated emphasis when he says that the coming study in industry must be the study of men and not machinery, and that the human element must dominate.

INDUSTRIAL ORGANIZATION

By Malcomb Keir. Ronald Press Company, New York, 1923. viii + 421 pp.

REVIEWED BY A. J. BEATTY

The author states, "The purpose of this book is to supply the background of facts about our industrial organization so that any subsequent delving into economics may be more vivid and real."

The author has sketched this background very well. In the fields of mining, lumbering, agriculture, and the various important lines of manufacturing, in transportation, marketing, and banking he has traced the development from remote beginnings to the present time, and has pointed out the main social and economic effects of each major charge.

While the author apparently has in mind to use this book as a stepping stone to the study of economics, the material and the manner of presentation makes it a valuable book for anyone who wishes to become an all-round business man.

HOOPINGARNER SELF-MEASUREMENT TESTS

Bureau of Business Guidance, LaSalle Extension University, 1923

MANUAL FOR VOCATIONAL SUCCESS

By Harry Walker Hepner, Syracuse, N. Y., 1923

REVIEWED BY H. L. HOLLINGWORTH

The Hoopingarner Self-measurement Tests for Executive and Business Ability are conceived in a concrete and interesting fashion and prepared in an intriguing form. Twelve "traits" are named. For Impressiveness, Initiative, Leadership, simple forms of questionnaire rating devices are employed. For Thoroughness, Concentration, Observation, Constructive Imagination, Organizing Ability and Knowledge, tasks of the intelligence test type are provided for execution and self-scoring. For Decision, Adaptability, and Expression, both types of device are used.

A convenient test pamphlet, a key, and a form for "Analysis of Vocational Interests and Aptitudes" comprise the materials. Instructions and explanations are given in simple and readily intelligible form, and a psychogram chart is furnished on which the individual is to map out his relative standing in the various respects. It is stated that the scores and averages are based on the previous study of "large groups of men."

It is easy to be captious in evaluating such a system of self-inquiry. Thus one might wonder why a "number checking" test is a measure of Concentration while a "substitution" test is instead an index of Thoroughness; why "word building" measures Constructive Imagination but "sentence completion" tests Adaptability. Similarly objection may be made to such assertions as "Your judgment and ability to make and stand by decisions are *measured* by your answers," etc., since actually all that can be said is that these traits are *asked about*. It may also be insisted that no adequate evidence has yet been presented to show that "The best index to a man's initiative is to be found in the manner in which he has actually expressed himself with respect to originality, enthusiasm and

perseverance." For initiative, so far as the writer knows, has not yet been demonstrated to be identical with self-esteem.

However, captious criticisms are out of place in evaluating this set of materials. The statements concerning what is attempted are on the whole entirely moderate and cautious. Although it is somewhat rashly stated that the results afford "an objective measure of standing in the twelve essential traits for business and executive success," this assertion is immediately qualified by the modest comment that "the results will show your strong and weak points in a light in which you have never seen them before."

The value of such a self-analysis scheme is actually complex. The attempt to rate one's characteristics, by any method, draws attention to them in a useful and reflective manner, and often reveals the depth of one's ignorance. The concrete illustrations and questions contained in the present materials may well serve to bring home clearly to the individual a host of wholesome suggestions concerning what one at least ought to be like. An honest effort to rate one's self may actually stimulate to a habit of self scrutiny that may be healthful. And finally, the intelligence tests scattered through the materials, if honestly done, may afford to an adviser something in the way of objective grounds for his advice. The Hoopingarner system attempts to do, in a somewhat abbreviated fashion, what the Yerkes-LaRue "Outline for the Study of the Self" did with such a mass of detail that the individual was at once overwhelmed and discouraged. On the whole it is the most entertaining and feasible scheme for the hurried attempt at self analysis by business boys that the reviewer has seen.

More ambitious, and significant in its ambition, is Hepner's Manual for Vocational Success, containing 117 pages of instruction, guidance, problems. Twelve points are featured all of them calculated to assist a young person in finding out his own make-up and endowment and fitting it successfully into a career. Self-analysis; analysis of occupations from the point of view of their requirements, their satisfactions, and their promise; evaluation of self equipment in terms of these occupational needs, occupy the major portion of the manual. The rest is given to a series of considerations relating to the planning of one's career, keeping fit, overcoming difficulties, rendering service, checking up progress, advantageous marketing of one's skills, and the like.

By a simple rating scale method some 75 designated "traits" are studied and summarized. Occasional test situations are also used, and inventories of preferences, failures, successes, experience, preparation and various advantages and handicaps are considered in some detail. A large section is then given in which practise is afforded in getting acquainted with a large array of vocations, and systematic effort is made at job analysis of these various callings. This is followed by a careful attempt to relate the results of the individual analysis to the array of occupations and activities, so that an enlightened choice may be more likely.

This enterprise is no short cut to self appraisal. The Manual must be used actually as the basis of a course in occupational analysis, direction and selection, and the reviewer understands that it is intended for this purpose. With a well informed instructor, with exercises repeatedly undertaken, compared, and criticised, in the evaluation of one's self and of others, and with experimental attempts to fit particular individuals into the setting for which their inventories seem best to fit them, this should be a very profitable course.

There is much to be said in favor of making such a program an important part of a high school or college freshman curriculum. Individuals intending to be vocational guides and directors, and teachers, could with real profit pass through such a course of training themselves. It represents a clear attempt to make a positive contribution toward the search for consciously planned careers. The time is still remote when short cut and thoroughly objective methods for vocational prescription can be even sensibly attempted. In the meantime such a well conceived temperately expressed, and comprehensively planned course of study and instruction as Hepner's

Manual is designed for serves a valuable end.

The Hoopingarner system requires about an hour and a half of the individual's time. The Hepner Manual calls for several months of inquiry, experiment, and criticism. It is probable that the method of self examination will yield results varying in value approximately with the amount of time the individual seriously gives to the enterprise.

THE PROBLEM OF THE WORKING BOY

By William McCormick. F. H. Revell Company, 1923. 192 pp.

REVIEWED BY R. F. LOVETT

A book written from the author's experience which should be helpful to others who have contact with young men as employees or members of clubs. It shows how to aid boys in becoming worthy men.

THE CLOTHING WORKERS OF CHICAGO, 1910–1922

By the Research Department, Amalgamated Clothing Workers of America (Leo Wolman, Eleanor Mack, H. K. Herwitz, and Paul Wander). Published by the Chicago Joint Board, A. C. W. of A. Chicago, 1922. 424 pp.

REVIEWED BY DAVID R. CRAIG

This book is the autobiography of a labor organization. It sets forth its history and achievements in excellent narrative style; and it has all the advantages and some of the disadvantages of autobiography.

A prefatory chapter discusses the organization, functioning, and personalities of the Chicago Joint Board, which is the general staff of the several clothing trades in the Chicago market. The rest of the book is divided in three parts.

The first part treats of the Growth of Organization mainly in terms of strikes and internal dissensions, because that is the way labor organizations generally grow. From the latter part of 1910 until 1919 the industry was marked by industrial strife. Early in these battles, on January 14, 1911 the firm of Hart, Schaffner and Marx signed an agreement with the union which immunized it from all the subsequent warfare. The arbitration machinery developed under this agreement has been a pattern for similar agreements wherever they have arisen in the industry. The secession from the United Garment Workers and the American Federation of Labor in 1914 is described vividly: the new Amalgamated Clothing Workers of America arose when the rank and file were persuaded, because of intrigue and the wholesale disfranchisement of their delegates, that the interests of their United Garment Workers leaders were not their own. Four and a half years later the entire Chicago market was organized under the new leadership, and on May 26, 1919, a mass meeting ratified the agreement with the National Wholesale Clothiers' Association.

In the second part, under the headings Wages and Hours, and the Great Wage Arbitrations, are set forth the achievements of the union in improving the lot of its members. Since wages are likely to rise when the bargaining strength of the workers is increased, the reader finds nothing here which he did not expect. Yet the solidarity of the clothing workers is incidentally

emphasized by the manner in which they dispose of some of their increased wages. It is characteristic of business trade unionism to believe in *laissez faire* and *sauve qui peut*, and the stronger, better-skilled unions have a marked tendency to act alone. But in this Chicago organization, essentially an industrial union, the bulk of at least one increase was given to those who were receiving the least, a levelling rather than a differentiating process. The leaders who can impose such an abrogation of "natural law" on their membership show a considerable measure of strength.

Government in Industry is the title of the third part. A detailed description is given here of the procedure of arbitration under the impartial machinery, first in the firm of Hart, Schaffner and Marx and later in the entire market. Two hundred and twenty-three cases are classified and cited to show the kind of difficulties which arise and the principles which guide the participants in settling them. This is by far the most important section of the volume to the lay reader, and is the result of a thorough piece of research by Mr. Paul Wander. Several chapters are given: The Powers of Management; Discipline and Discharge; Working Conditions; The Adjustment of Wages; and The Principle of Union Preference. Under each of these headings the principle is first discussed, then a number of cases are adduced to show how that principle has worked out in the daily routine of the adjustment machinery. It is an invaluable statement of the industry's code of law, not only for the investigator who takes an outside view, but also for the minor officials, the non-commissioned officers, on whom the responsibility for conducting the agreement falls most heavily.

As an impartial statement of fact the volume is not too successful. It has the advantage that the authors know what they are talking about; it has the disadvantage that one often feels they know more than they are talking about, and that they have intentionally withheld some data unfavorable to the organization. For instance, only a few of the many cases cited were decided against the union by the impartial machinery. Presumably this represents the distribution of decisions accurately, because the union was on a rising wave and its strength was bound to be reflected in the decisions. But it is equally conceivable that the union made some mistakes or put forth unreasonable demands at times, and it would be interesting to find more traces of the adverse decisions.

Suppose, too, that an employer in another industry has heard of the "advanced" work of the clothing business, and turns to this book for enlightenment on his own labor problems. Unless he is a philosophical democrat, which he is usually not, he will be strongly repelled from industrial democracy. Feeling, as he ordinarily does unconsciously, that labor coöperation must be expressed largely in terms of obedience, he will be amazed at the petty restrictions on the traditional powers of management, by which the manager must not do anything until he has first requested the permission of his employees, particularly in small matters like slight changes in individual jobs; and he will almost certainly call these restrictions outrageous and intolerable. He will notice, moreover, that behind each precedent of the code looms the force of the union operating through the joint machinery, and he will picture a city of clothing manufacturers enjoying the privileges of industrial democracy only because they are compelled to.

But there are two reasons why such a view of this book is distinctly unfair. The first is that it is incomplete. The principles discussed in the third section were summarized briefly by Mr. Tead some time ago in the words "voluntary consent in advance." The point to notice is that the cutter and the trimmer and the armhole-baster and the presser are not concerned with the principle, but only with the work on the benches before them. Minor changes in their jobs are regarded by them as a nibbling at their standards, and the restrictions are merely their defense against encroachments which they remember only too well. A union analyzing its history would justifiably point to its success in controlling these minor "infringements of rights" which after all constitute the majority of industrial grievances. In addition,

the important fact will be recalled that with all these rules and red tape, Hart, Schaffner, and Marx have been doing business at the old stand for twelve years.

The second reason why the cursory position taken above is unfair is that the purpose of the volume was not considered, and in all fairness it must be considered. The book was not written for supposed employers in other industries; it was written for the membership of the Amalgamated Clothing Workers of America. It is a piece of self-research for the purpose of self-education. In this sense it is propaganda, and some partiality, self-justification, even whitewash, can be excused. We learned during the War that we must not expect to find the history of mistakes and defeats in the communiqués of the general staff. In the same way a book which is intended to build morale and serve as a manual for non-commissioned officers can hardly be expected to call into question the righteousness of the cause.

Viewed in these terms, then, Part I glorifies the past by showing the early struggles; Part II shows how the organization is a successful going concern; and Part III, by concrete evidence of the difficulties which arise, educates the membership in self-control and understanding of the problems of management. Self-control on both sides is indispensable under agreements of this sort and is more difficult for the union than for the manufacturers, because of the greater scatter. This union attacks its problem with reason and persuasion and education, and not with intrigue or the disfranchisement of rebellious delegates.

THE CHARITY ORGANIZATION MOVEMENT IN THE UNITED STATES

By Frank D. Watson. The Macmillan Company, New York, 1922. xii + 560 pp.

REVIEWED BY M. C. BURNETT

One reviewer of Mr. Well's "Outline of History" has remarked that in the past, history, if it is not in the diluted form of text books for the young, has usually been written "by the Ph Deified and for the Ph Deified." Mr. Watson's "History of the Charity Organization Movement in the United States" would seem to be an example of this latter type.

The book attempts a summary of the development of principles and practice in charity organization from the period of its beginnings until 1921, with an introduction on the foreign antecedents of the movement. This chapter is one of the best in the book, possibly because the author's distance from the subject has enabled him to economize in detail sufficiently to "see the wood for the trees." This he conspicuously fails to do in his study of the movement in the United States, partly due to his method of treatment, which consists of enumerating developments all over the country according to the period in which they occurred. In this way it is very difficult for the reader to grasp the significance of the sequence of events in any one locality, and the writer being bound by this rigid "time element" has been unable to deal effectively with many of the important relationships between the movement and other social developments. In no place, for instance, do we find an adequate discussion of the attitude of the social settlement to the Charity-Organization Society, and the treatment of the modern development of public welfare in its relation to voluntary charity seems strangely inadequate. The somewhat surprising hostility manifested by the C. O. S. group as a whole to the recent growth of the movement for widows' pensions is complacently concurred in, with the comment that much of this legislation might possibly have been *prevented* had the voluntary socie-

ties handed their widows' cases more efficiently! There is little comprehension of the difference between the new public welfare, particularly as it has developed in the western states, and the old conception of Poor Relief against which private philanthropy so naturally rebelled. In at least one locality on the Pacific Coast known to the reviewer, the standards of the public agency are higher in many respects than those of a neighboring private society.

This failure to view the movement under discussion objectively, and in a thoroughly critical spirit is characteristic of much of the book. There is a chapter on "Prejudices and Criticisms" but it is devoted to a refutation of popular misconceptions about the aims and methods of family case work, not to any fundamental examination of the thing itself in an impartial way. Some societies, it is admitted, do not live up to standards, but the movement is not to be blamed for that.

The fact that the writer is an observer, rather than a worker in the field, is reflected in the way that many of the thorny problems, with which the case worker wrestles in the day by day task, are assumed to be either non-existent, or easy of solution, because they are considered only in the abstract. How can "adequate relief" for instance be reconciled with the "case method" of raising it, i.e., the effort of the worker to find, from whatever source she may, the necessary funds to meet the needs of the individual family with which she deals? Both of these principles Mr. Watson accepts as axiomatic, without recognizing any essential conflict. Volunteers, he holds are the backbone of the case work agency,—but they must be both carefully chosen and well trained. He does not answer, or even raise, the question, "Where can we find people today who are willing to give the necessary time and energy to both training and service to enable them to develop professional standards and who at the same time desire no compensation?" Nor the further question, "Is it after all reasonable to expect them to do so?"

Although the book is certainly not a popular exposition of the charity organization movement for the consumption of the lay public, it will possibly be enjoyed by those workers who are content to see their own theories expounded and given the sanction of the historian's approval, and it undoubtedly contains much material that is important to students of social work. The chapter on "Tests of Efficiency" may give any executive a few uncomfortable moments if he tries to measure his society up to all of them, but there will be no serious questions aroused in his mind as to whether family case work today is being carried on in the most effective manner possible in relation to other trends that are manifest in the current of social thought and action.

Abstracts

Research Committees. W. K. HATT. Science, September 14, 1923, Vol. 58, No. 1498, pp. 195–198.

Although this article was written primarily with reference to highway research, it applies more or less to research in general. It is a difficult problem to draw a line between the fields of so-called academic research and so-called industrial research, for both must advance by scientific methods. As a class set apart by their tastes and aptitudes from the class of producers, research workers are one family.

A list of the features of research, gathered together from various sources such as committee reports of Sigma Xi, is as follows:

1. Research work may be in industrial fields or in abstract science.

2. The research may lie in the field of any branch of knowledge that is treated in a scientific spirit.

3. The method of research may be by deduction or by induction.

4. The qualities of true research are: earnestness, devotion, diligence, system, original and creative work.

5. Skill and initiative in devising suitable methods and apparatus for use in observation, skill in arranging and interpreting data, and care and devotion shown in difficult observations should be given recognition.

6. The result should be the discovery of something hitherto unknown.

Function of Research Committees. In the first place such a committee must consider the individual researcher who is often temperamental. His initiative, originality, and imagination must be given free rein. The purpose or working plane of an organization should not dampen these desirable qualities of an individual researcher. A research committee should neither assume an attitude of proprietorship and control of the individual researcher whose initiative and freedom are necessary conditions of his work, nor attempt to formulate standards of methods of test. Reports of research committees should not be used for channels for publication of investigations, although a summary of conclusions from published investigations would show the status of research.

The three outstanding functions of a research committee are:

1. The coördination of the researchers in connecting fields.

2. A survey of the data of research to appraise progress, to recommend further work, and to evaluate the application of research work in industry.

3. The organization of a close relationship between the laboratory and the field.

Problems of Industrial Safety. W. H. CAMERON. National Safety News, October, 1923, Vol. 8, No. 4, pp. 23–24.

Raises the following questions: "Why is it rare to find an appreciable number of industries consistently and continuously maintaining enterest and exercising complete authority in safeguarding the lives and limbs of the workers housed in their plants? Why is it that so sensible a thing as keeping every worker at his task the maximum number of employable hours seems to be so much neglected by managers in business? Are the following several of the reasons?"

1. The fact that while collectively the accident bill runs into many millions, the cost to the individual industry is relatively small. Aside from the catastrophe problem, the percentage of gross receipts of any industry, mine, or railroad expended for accidents does not exceed six per cent, except in very rare cases, and the president says: "I am interested in the problems of the 94 per cent of the business."

2. While a Japanese disaster, a European war, or a San Francisco earthquake will

stir the sympathy of every individual, the day-by-day catastrophes totalling in a year thousands of lives lost and a continual financial drain will arouse little interest. The subconscious mind refuses to face the possibilites of death and suffering. People prefer to hear about pleasant things.

3. When business is at the top notch of production and men are affluent and pleasure seeking, the little things such as the few per cent of losses due to accidents suffer for attention in the business. When the pinched times of limited production come, all of the frills relating to the "welfare of the worker" are cast off.

4. The science or art of filling every human need is worked out through many years of experience and adaptation, during which there is always skepticism as to practical values. Safety as a science is new; its individualization is a recent thought in human economy.

5. There is a lack of leadership in Safety. The economic stake in many individual industries is small, and small men have been given the responsibility. Few safety men have the courage or persistence to fight the factors of production; the natural enmity of the individual to an interference with his personal prerogatives and an insistence upon conformity to rules that may be contrary to his training and instincts.

The folowing suggestions are offered for an attack of the problem of Safety in the future.

1. Our workers, our citizens, must first understand what Safety is, it must become a desirable and sought-for attribute of living.

2. The second requisite for less life wastage and needless suffering is everlasting publicity. The facts about accidents are not known. When the social consciousness towards accidents becomes as sensitive as to murder and theft, there will be fewer accidents.

3. The science of Safety must be furthered so that it will be possible to hand to the manager of any kind of workshop, or railroad, or mine, or lumber camp, a condensed portfolio of information and say: "Every item of engineering standards, every habit and practice and rule advocated in this book has been tried out and is applicable to your business."

4. The tasks of the Safety Engineer may be merged with the human relations division in industry, but, at any rate, Safety must become an integral part of the industrial organization.

5. There is still the difficult problem of interesting and encouraging the owners of small plants to organize and maintain interest in Safety, but through general publicity education, the pressure of inspections and penalities for non-conformity to Safety laws, even these may be reached.

The Cost of Foremen Training. B. M. NUSSBAUM. Industrial Management, August, 1923, Vol. 66, No. 2, pp. 101–103.

The cost of foremen training depends upon the training system that is used. One simple system consisting of periodical lectures given by officials of the plant to assembled foremen is generally thought to be the least expensive. However, actual experience in using this system shows that it is a very expensive one. The difficulties with this system are:

1. Executives must sacrifice time from their executive duties to prepare the lectures.

2. Executives cannot always qualify as successful instructors and the foremen lose interest in the training.

3. The failure of such a system destroys the foremen's confidence in training systems. It becomes more difficult to install a training system where an effort at training foremen has failed.

Another training system, the company course, has likewise been found to be very expensive. Under this system an educational expert is employed to make a thorough survey of the needs of the plant and draw up a training program. This is a very expensive procedure and many times after a year's trial the course has to be discarded and a new one constructed. The first one failed to be adaptable to the needs and limitations of the foremen.

Midway between these two extreme systems is the standardized course which is really a combination of the methods repre-

sented by the other two. The standardized course contains specially prepared material and presents the material to the foremen in the form of lectures. But instead of charging the whole cost of preparing the lecture material to one company, the cost is distributed by syndicating the material to many companies. Instead of executives taking time from their normal duties to give lectures, the standardized course makes use of specialized lecturers who are well trained for such tasks.

The cost of training under this system is much less than for the other two and can be accurately computed. Under such a system figures show that a significant increase in production occurred after the course had been given.

Perhaps the best results of the standardized course have been secured when the training system is offered on a coöperative basis. The foremen share the expense equally with the company. This usually causes the foremen to take a more serious interest in the training. In some cases companies have refunded the expenses shared by the foreman if he completes the course satisfactorily.

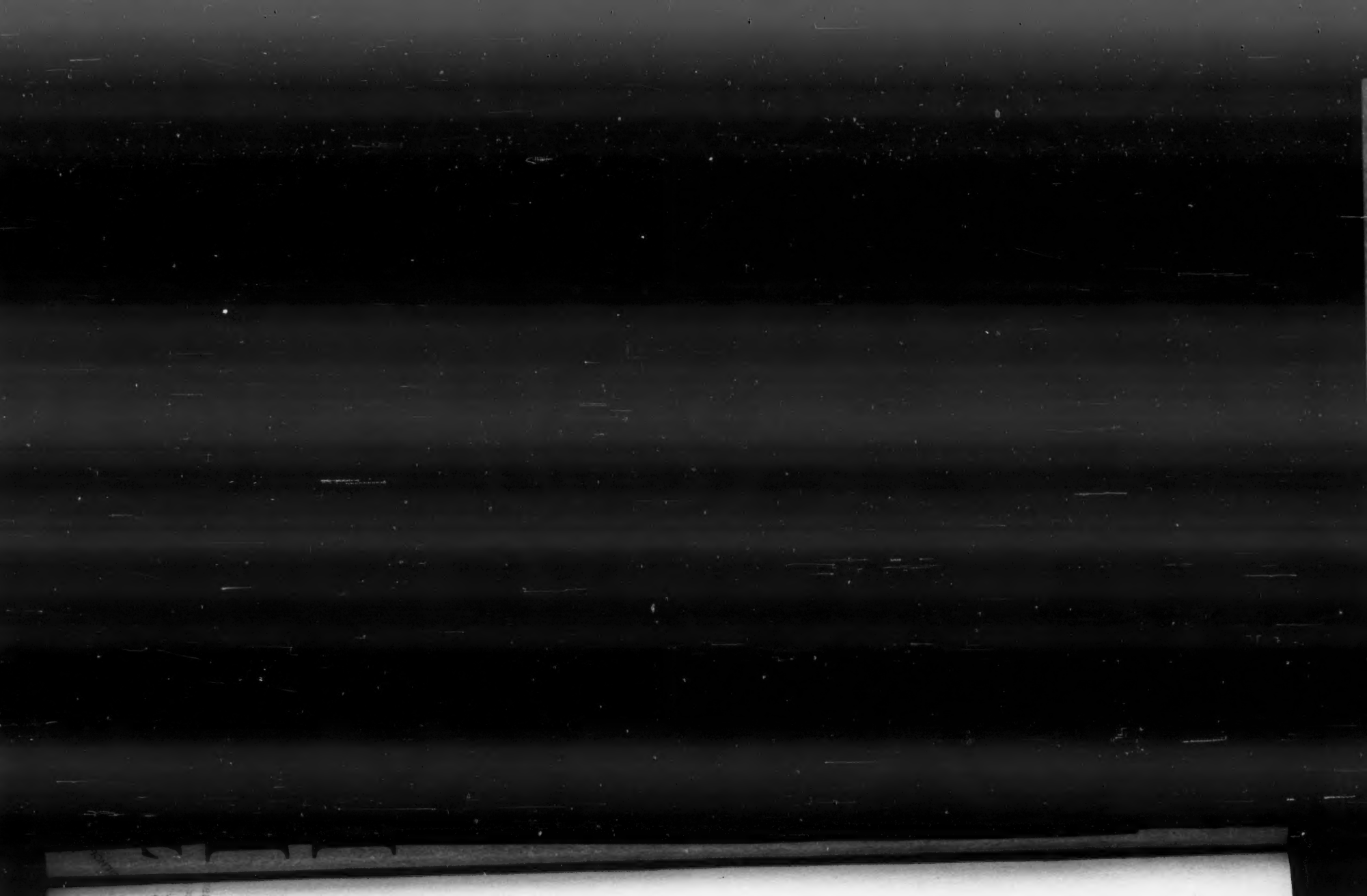
How Much "Good Time" Pays at a Convention? System, October, 1923, Vol. 44, No. 4, pp. 436–439.

Reports that in analyzing over 200 national sales conventions, it is clear that there is no common practice. The attitude of prominent sales managers can, however, be classified in three groups: (1) those who hold that conventions should be all but entirely free from social activities; (2) those who feel that social activities are a necessary evil, and treat them as such; and (3) those who feel that the social side of conventions is, in the long run, the most important, and that the value of the goodwill built by social affairs at convention time makes it wise to insure social success, while limiting the purely business sessions to a minimum.

It is only fair to those who hold these conflicting views to point out that each group makes a strong case, but based on entirely different conditions. A prominent Indiana sales manager gives as the reason for "putting the soft pedal on social activities" the fact that their sales force of 60 men is composed largely of youngsters in their twenties, unmarried and anxious to climb the ladder of business success. Having them under very close supervision at all times, it is found best to be extremely business-like in all dealings with this type of ambitious youngsters. Consequently, this attitude is maintained in conventions.

A representative of the second group states that they do not believe in making a plaything of sales conventions, as they cost too much money. They do, however, feel that the sales force has been so successful, both in good years and bad, for their industry that they (the sales force) expect to be patted on the head and entertained when they come to headquarters. The result is one evening set aside for a smoke-talk, at which professional entertainers are provided, and another evening for an elaborate banquet. Thus, the sales manager states, "we do away with a common practice of wasting executive brains on elaborate social functions and, at the same time, do entertain our 'guests' on two occasions in a highly satisfactory manner."

A disciple of the third group states that their sales conventions are designed to sell to the salesman the idea that they have not only the best manufacturing facilities in their lines, but also that their system of handling their orders, from start to finish, includes very able department managers with thoroughly capable assistants. The sales convention is used as an opportunity to prove in a thoroughly human way the real character of the inside staff, by the presentation of social affairs which show carefulness in planning and cleverness in execution.

The social side of conventions may well be divided into three groups: (1) entertainment of visiting salesmen and branch managers; (2) entertainment of visiting ladies; (3) entertainment of executives' wives and of executives other than those of the merchandising staff.

A typical convention layout of entertainment for the salesmen might include: (1) "get-together" evening; (2) sports; (3) stunts; (4) theater parties; (5) luncheons; (6) banquet. Each of the above are then taken up in detail.